

# **Self-broadened Widths and Frequency Shifts of Water Vapor from 590 cm<sup>-1</sup> to 2400 cm<sup>-1</sup>**

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## ABSTRACT

This study reports experimental self-broadened line widths and pressure-induced frequency-shifts of water vapor in the spectral region between  $590\text{ cm}^{-1}$  and  $2400\text{ cm}^{-1}$ . Over 1900 vibration-rotation transitions have been measured at  $0.0054\text{ cm}^{-1}$  resolution using the Fourier transform spectrometer at Kitt Peak National Observatory. Self-broadening parameters have been obtained for the (000)-(000), (010)-(010), (010)-(000), (020)-(010), and (100)-(010) vibrational bands of  $\text{H}_2\text{O}, \text{H}_2^{18}\text{O}$ , and  $\text{H}_2^{17}\text{O}$ . The observed widths range from  $0.52$  to  $0.1\text{ cm}^{-1}/\text{atm}$ , and the pressure shifts fall between  $\pm 0.05\text{ cm}^{-1}/\text{atm}$ . The present linewidth coefficients are compared to measured and computed values given previously in the literature. There have been no prior studies for self-broadened frequency-shifts of water vapor for this spectral region.

## 1. INTRODUCTION

In tropospheric spectra recorded for remote sensing applications, the air-broadening effects on water vapor are generally more important than the self-broadening. Nevertheless, reliable self-broadening parameters are necessary in order to obtain accurate representations of tropospheric spectra because the self-broadened width is generally five times larger than its air-broadened counterpart. For example, when the atmospheric  $\text{H}_2\text{O}$  content near the ground is  $\approx 2\%$ , then  $\approx 10\%$  of the linewidth observed in near-surface spectra will be due to self-broadening. Another example involves pressure-induced frequency-shifts of water vapor. The findings of this study and that of a forthcoming publication on air-,  $\text{O}_2$ -, and  $\text{N}_2$ - broadening of  $\text{H}_2\text{O}$  show that for some transitions the magnitude of the self-broadened shift is larger than the air-broadened frequency-shift, demonstrating the necessity of knowing the self-broadening parameters of water vapor to good accuracy.

This study reports extensive measurements of self-broadened widths and pressure-induced frequency-shifts of water vapor between  $590 \text{ cm}^{-1}$  and  $2400 \text{ cm}^{-1}$ . Previous studies of self-broadened  $\text{H}_2\text{O}$  widths for this spectral region include the measurements and calculations by Mandin et al,<sup>2,3</sup> the early work on computed widths by Benedict and Kaplan<sup>4</sup>, and the calculated widths given in the 1992 HITRAN<sup>5</sup> database. There have been no reported studies on self-broadened frequency-shifts of water vapor for this spectral region.

## 2, EXPERIMENT

The high resolution laboratory spectra were recorded with a Fourier transform spectrometer (FTS) at the McMath Solar Telescope at the Kitt Peak National Observatory

/ National Solar Observatory. The infrared radiation from a **globar** source was collected onto helium-cooled arsenic-doped silicon single element detectors. Each FTS run consisted of 12 or more interferograms coadded over a period of an hour to achieve a signal to noise ratio of 300:1 or better. The composite interferograms were transformed into spectral data at the Kitt Peak facility.

The experimental conditions of these data are given in Table 1 which lists the spectral coverage of measurements, the unanodized spectral resolution, the absorption path lengths, and sample pressures and temperatures. Sample temperatures were inferred from thermistor probes in thermal contact with the absorption cell walls while the sample pressures were measured with Baratron gauges with 10 and 100 Torr pressure heads. These data were also included in a new analysis<sup>6</sup> of line strengths of the (000)-(000) and (010)-(000) bands of H<sub>2</sub><sup>16</sup>O.

The top eight entries in Table 1 represent data obtained with two stainless steel absorption cells (1.5 m and 0.25 m in length) that were placed in tandem between the **globar** source and the vacuum tank which encloses the FTS. All portions of the external path and the source enclosures were evacuated to  $\approx$ 0.1 Torr pressure by using some newly-installed apparatus. The frequency calibration for the 0.25 m path length runs were determined by comparing the standard positions of the fundamental band of CO<sup>7</sup> to observed line centers using 0.04 Torr of CO in the 1.5 m cell. The frequency off-set for the 1.75 m runs was assumed to be the same as the 0.25 m runs.

The spectral runs obtained with path lengths of 25 m or greater were made with a 6-m base length multiple transversal absorption cell. The optical path from the long path cell

to the vacuum tank of the FTS contained a 2.39 m long evacuated cell and several compartments which were purged with dry N<sub>2</sub>. The optical path length from the exit of the 6-m cell to the entrance of the vacuum tank was about 5.5 m. This setup greatly reduced interference from H<sub>2</sub>O spectral absorption due to room air. Also included in the recent study<sup>6</sup> was spectral runs obtained with the 6-m cell at H<sub>2</sub>O pressures of less than 0.5 Torr. For one of the runs (73 m path, 0.486 Torr pressure), a small amount (0.2 Torr) of N<sub>2</sub>O was added to 2.39 m cell for purposes of frequency calibration below 1200 cm<sup>-1</sup>. The very low pressure residual room air in the vacuum tank also contained enough CO<sub>2</sub> so that the strong ν<sub>2</sub> lines were observed in the spectra below 700 cm<sup>-1</sup> and these lines were also used for frequency calibration. It was assumed that the runs made at sample pressure of about 4.8 Torr had the same frequency off-set as the lower pressure runs for the region above the CO<sub>2</sub> region of influence (above 900 cm<sup>-1</sup>). CO<sub>2</sub> low pressure lines were also observed in the ≈ 4.8 Torr runs and the frequency corrections due to the CO<sub>2</sub> calibration were the same for both the low and higher pressure runs. For the 6-m cell low pressure runs, the measured line positions were calibrated and corrected by reference to accurate H<sub>2</sub><sup>16</sup>O frequencies for the spectral region above 1200 cm<sup>-1</sup> and the N<sub>2</sub>O<sup>9</sup> and CO<sub>2</sub><sup>5</sup> lines were used to calibrate the H<sub>2</sub><sup>16</sup>O features below 1200 cm<sup>-1</sup>.

### 3. SPECTRAL ANALYSIS PROCEDURE

A computer algorithm<sup>10</sup> of nonlinear least squares (NLLS) curve fitting was used to retrieve experimental values of line positions and strengths from the spectral data listed in Table 1. In order to obtain accurate linewidth values from the data, it is necessary to know

the instrument function (spectral resolution) to high accuracy, especially for the 4.8 Torr data. The  $\text{H}_2\text{O}$  lines with linewidth parameters of about  $0.4 \text{ cm}^{-1}/\text{atm}$  were observed in the long path length spectra with Voigt line shapes in which the broadened widths were about equal to the spectral resolution and a little larger than the Doppler width. The instrument function was determined in this study by matching observed and computed spectra of vacuum tank low pressure water vapor lines using the NLLS program at zero anodization. These spectral runs are not given in Table 1, and they were taken just before the respective short path and long path data were obtained with the cells evacuated.

The observed line positions were compared to computed frequencies for the (000)-(000), (010)-(010), (010)-(000), (020)-(010), (100)-(010) bands of  $\text{H}_2^{16}\text{O}$  and the (000)-(000) and (010)-(000) bands of  $\text{H}_2^{18}\text{O}$  and  $\text{H}_2^{17}\text{O}$  from which the experimental pressure-induced frequency shifts were determined. These shifts were normalized by dividing the difference between the observed and computed line position by the sample pressure. The computed transition frequencies were derived from the energy levels given in: ref.(5) for the (000) and (010) vibrational states of  $\text{H}_2^{16}\text{O}$ , ref.(8) for the (020) and (100) states of  $\text{H}_2^{16}\text{O}$ , and ref(9) for the (000) and (010) states of  $\text{H}_2^{18}\text{O}$  and  $\text{H}_2^{17}\text{O}$ . The linewidths measured with sample temperatures at near 302 K were converted to a value at 296 K by using the relation,

$$b^\circ(296) = (T/296)^\eta b^\circ(T), \quad (1)$$

where T is the experimental temperature. A value of 0.6 for  $\eta$  was used in this work. This may not be correct for many of the transitions, but a 50% uncertainty in  $\eta$  produces only a 0.5 % uncertainty for the widths measured at the slightly elevated temperature. The measured shift and linewidth parameters labeled d“ and b“, respectively, (both in  $\text{cm}^{-1}/\text{atm}$ )

were weighted and averaged for each transition. Transitions with intensities greater than  $1.5 \text{ cm}^{-2}/\text{atm}$  at 296 K were generally too saturated to be measured in these data. The coefficients for the stronger and intermediate intensity features of  $v_2$  were taken from three or five short path spectra while the rotational transitions below  $1300 \text{ cm}^{-1}$  were primarily retrieved from four long path scans.

#### 4. RESULTS

The resulting averaged pressure-induced shifts do and halfwidths (HWHM)  $b^\circ$  are shown in Table 2. The initial columns give the upper and lower state rotational quantum numbers, vibrational band notation [ upper state ( $v_1 v_2 v_3$ ) - lower state ( $v_1 v_2 v_3$ ) ] followed by the isotopic code (where 6 =  $\text{H}_2^{16}\text{O}$ , 7 =  $\text{H}_2^{17}\text{O}$ , and 8 =  $\text{H}_2^{18}\text{O}$ ). The next column shows the line center in  $\text{cm}^{-1}$ , derived from the vibration-rotation energy levels<sup>6,11,12</sup> for zero pressure followed by the self-broadened pressure shifts in units of  $10^6 \text{ cm}^{-1}/\text{atm}$  with estimated uncertainties of the last digits in parentheses. The final columns give the present observed widths in  $\text{cm}^{-1}/\text{atm}$  with uncertainties in parentheses, followed by smoothed values (described later), and corresponding values from the 1992/ 1996 HITRAN database<sup>s</sup> and from Benedict and Kaplan<sup>4</sup> (BK). In all over 1500 entries are given in Table 2. The selection presented has been limited to those measurements for which the estimated uncertainty in  $b^\circ$  was less than 10%, and the RMS of these uncertainties is 3. 1%. Although not given, an additional 340 experimental values were obtained with uncertainties between 10% and 20%. The widths range from 0.52 to 0.1  $\text{cm}^{-1}/\text{atm}$ . The variation of the widths as a function of the rotational quanta is shown in Fig. 1; the observed widths of the  $v_2$  band of  $\text{H}_2^{16}\text{O}$  are plotted as a

function of  $km$  with the value of  $jm$  as the plot symbol. The terms  $km$  and  $jm$  refer to the maximum  $K_a$  and  $J$  respectively, in the manner used by Brown and Plymate<sup>13</sup> in the study of Hz-broadened water. For example,  $km = 1$  and  $jm = 3$  pertain to both of the rotational transitions 313-202 and 303-212 in Fig. 1. The term,  $km-jm$ , is used to offset the plotting symbol to reveal the trends in the data. As was seen for the Hz-broadened water widths, at low  $km$ , the widths decrease greatly with increasing  $jm$ , while at the highest  $km$ , they increase in proportion to  $jm$ . At intermediate  $km$ , the patterns are not as apparent.

To demonstrate the behavior of the widths and shifts, the measurements given in Table 2 are listed not in an order of increasing frequency but according to “families” of transitions defined by  $AJ$ ,  $\Delta K_a$  and &. Within a “family” of transitions, the rotational quantum numbers obey the following rules:  $\Delta K_a$  and  $K_a''$  are the same and  $y'$  is 0 or 1 and  $y''$  is 0 or 1 where

$$\gamma = K_a + K_c - J \quad (2)$$

and prime and double prime denote upper and lower states, respectively. For example, the rotational transitions, 111- 000, 212-101, 313-202, etc. correspond to a “family” also represented by symmetric top notation,  $R^R_0(J'')$ . Transitions with the same rotational quanta from different isotopes and vibrational states are co-located in the listing so that widths and shifts can be readily compared to investigate the vibrational and isotopic dependence.

The listing is also being presented in this fashion because in most cases, the widths follow a pattern within a “family”, and “smoothed values” for the  $b''$  determined by plotting the experimental  $b^o$ s vs  $J$  are also included in Table 2. Such patterns for the pressure shifts  $d''$  were not apparent within a “family” and therefore no attempt was made to obtain smoothed

values of d“.

A few entries given in Table 2 are repeated in Table 3 to illustrate the width behavior for transition pairs with their rotational quanta reversed and also the consistency of values for the isotopic species having the same rotational transition. In this table, transitions are grouped according to their common rotational quanta in a format similar to that of Table 2 with the exception that the last column shows the ratio of the observed b“ to the smoothed width. Inspection of the widths of the (010)-(000) band reveals that the isotopic species have very similar values as do the pairs of transitions in which the rotational quantum numbers are reversed. That is, in many cases, width b“ for the rotational transition  $J'K_a'K_c'$ - $J''K_a''K_c''$  is the same as for the transition  $J''K_a''K_c''-J'K_a'K_c'$  (rotational quanta reversed in value); this is not the case for the shifts do's except at high J for a few “families”. Some intriguing differences are seen between the widths of the ground and hot bands (such as the 221-212, 212-221, and 110-221 transitions), but the differences are often less than 10%. A detailed illustration of the behavior of widths involving pairs of transitions whose rotational quanta are reversed is shown in Fig. 2. In this plot, the widths  $b^\circ$  are shown for the transitions belonging to the two related “families”  $R_R_0$  (lower state  $K_a = 0$ ) and  $P_P_1$  (lower state  $K_a = 1$ ). The experimental values are plotted against jm. The symbols given in the figure are R for the R-branch and P for the P-branch transitions. The widths of the transition pairs are seen to be nearly equal which provides extra confirmation to the experimental precision of the self-broadened widths.

In most cases, the observed pressure-broadened widths are the same value for rotational reversal, and this behavior is predicted by theory. However, several transitions are found

not to obey this rule, as illustrated in Table 4. This listing gives rotational quantum numbers, the “smoothed values” of  $b^\circ$  for pairs of transitions and the differences between the widths (cliff). For the columns labeled R or Q(+) transitions, the 3 left quanta are the upper state rotational numbers, and the Q(+) means  $AK_a = +1, +3$  etc. For the columns labeled P or Q(-), the 3 left quanta are the lower state numbers, and Q(-) means  $AK_a = -1, -3$  etc. Inspection of the difference column reveals several interesting points. The differences in the widths are much larger than the nominal experimental uncertainty of 3%. These occur at higher values of J and  $K_a$ . Within the right column data which are primarily ‘R, ‘P pairs or Q(+), Q(-) pairs, the differences are often positive at low J and negative differences at higher J; the crossover point is marked by \* next to the difference column. It will be interesting to see how well current theoretical models can reproduce this behavior.

At first inspection, the pressure shifts listed in Table 2 appear to have no smooth behavior as a function of the quantum numbers. They jump randomly from negative to positive values, varying between  $+0.05$  to  $-0.5 \text{ cm}^{-1}/\text{atm}$ , and this behavior could be related to problems with experimental accuracy. However, closer inspection of particular subset pairs of families in Tables 2 and 3 reveals that the shifts of the isotopic transitions of  $v_2$  are fairly consistent. In addition, the pairs involving the same quantum numbers often have shifts that are opposite in sign. Some interesting patterns related to this trend are illustrated in Figs. 3 and 4. In these plots of the frequency shifts versus “JM” (maximum J of the transition), the shifts of one family appear to be a mirror image of the other family. Figure 3 shows the  $^R R_0, ^P P_1$  families, involving  $K_a = 0$  and 1 with  $y = 0$  and 1 [e. g., the transition 919-808 so that  $JM = 9$ ]. Figure 4 shows the Q-branch subsets,  $^P Q_2$  and  $^R Q_1$ , involving  $K_a =$

1 and 2 with  $\gamma''$  and  $\gamma' = 1$  [e. g., 919-92 8]. The values used in the plots are primarily of the  $v_2$  band of  $H_2^{16}O$  from Table 2; however other isotopic results were used if values of the main species were not available. It is emphasized that the transition whose shifts are shown in Fig. 3 are the same as those whose pairs of widths are equal within 396, as shown in Fig. 2. Because the widths are well measured, it is assumed that these observed shifts have reliable precision as well. For laboratory studies that wish to use water transitions as frequency calibration standards, it is important to understand the true accuracies of the measured shifts. However, at this point, it is difficult to validate the tabulated experimental uncertainties for the present pressure shifts.

Comparisons of the present results for widths with prior values<sup>2-5,16,17</sup> follow. The self-broadened widths from HITRAN 1992/1996 and calculated values from Benedict and Kaplan<sup>4</sup> are shown in the two right column on Table 2. Table 5 gives the present smoothed experimental widths and those from other prior studies<sup>2,16,17</sup>. The first 166 entries are from Mandin et al.<sup>2,3</sup> covering transitions in the  $v_2$  band from 1777 to 2246 cm<sup>-1</sup>. Four measurements by Langlois et al.<sup>16</sup> from 7230 to 7233 cm<sup>-1</sup> for the  $2v_1$  band are included along with 19 experimental values from Grossmann and Browell<sup>17</sup> representing transitions in the  $2v_1 + 2v_3$  band from 13601 to 13942 cm<sup>-1</sup> (one transition at 13941.44 cm<sup>-1</sup> belongs to the  $4v_2 + 2v_3$  band). The values given within the parenthesis are their<sup>2,3,16,17</sup> uncertainties in the last digit(s) of the values of  $b''$ . Grossmann and Browell<sup>17</sup> did not list individual errors with their linewidth measurements but stated that the estimated errors were between 3% and 6%. For the presentation in this work, we adopted an uncertainty in their width measurements of 5%. Table 6 shows the average ratio of the present / prior widths along

with the minimum and maximum ratio, and rms difference in percent. The ratio values of the other sources vary considerably although the average ratio values are within 12%. A pressure broadened theory presented several years ago by Tsao and Curnutte<sup>14</sup> indicates that there is very little vibrational dependency on the value of  $b''$  for a given rotational transition. Recently, Lynch et al.<sup>15</sup> obtained computed results using an advanced theory which implies definite vibrational dependence for particular rotational transitions. While the entries at shorter wavelength are generally higher than the smoothed values for  $v_2$ , and there are too little data to demonstrate vibrational dependency for  $b''$ .

## 5. CONCLUSION

Accurate measurements of over 1900 self-broadened widths and pressure-induced frequency shifts of water vapor are now available for the 5 to 16  $\mu\text{m}$  region. These data can be grouped into “families” of transitions to reveal interesting trends as a function of the rotational quantum numbers. The values are similar for the same transitions of  $\text{H}_2^{16}\text{O}$ ,  $\text{H}_2^{17}\text{O}$ , and  $\text{H}_2^{18}\text{O}$ . There appears to be small variations between the  $v_2$  band and “hot” bands of the widths and shifts for some of the transitions. These new data can be used for tropospheric remote sensing applications, and they will provide a rigorous test of theoretical models for these self-broadening parameters. In addition, the new pressure shifts will diminish current uncertainties that hinder the use of water features as frequency calibration standards in laboratory studies. The full lists of experimental values can be obtained from the authors.

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## FIGURE CAPTIONS

**Figure 1.** Composite of all observed width parameters  $b''$  in units of  $\text{cm}^{-1}/\text{atm}$  for the  $\nu_2$  band of  $\text{H}_2^{16}\text{O}$  as function of  $km$  (maximum  $K_a$ ) with  $jm$  (maximum  $J$ ) as the plotting symbols. The small  $(km-jm)$  term is used to offset the plot symbols.

**Figure 2.** The self-broadened widths (HWHM) of water in  $\text{cm}^{-1}/\text{atm}$  for the  $^R\text{R}_0$  and  $^P\text{P}_1$  transitions as a function of  $jm$  (the maximum  $J$  of the transition quanta). The R and P symbols denote R- and P-branch transitions, respectively.

**Figure 3.** The self-broadened pressure shifts of water in  $\text{cm}^{-1}/\text{atm}$  for the  $^R\text{R}_0$  and  $^P\text{P}_1$  transitions as a function of  $jm$  (the maximum  $J$  of the transition quanta). The R and P symbols denote R- and P-branch transitions, respectively for the transitions whose widths are shown in Fig. 3.

**Figure 4.** Shift parameters in  $\text{cm}^{-1}/\text{atm}$  for the ' $Q_u$ ' and ' $Q_l$ ' transitions with the subset  $\gamma'' = 7' = 0$  given in the upper panel and the other subset of transitions,  $\gamma'' = \gamma' = 1$  given in the lower panel as a function of  $jm = J$ . The symbols 1 and 2 denote lower state values of  $K_a$ . The shift values are connected by straight dashed lines for each of the four Q-branch subsets shown in both panels.

## FIGURE CAPTIONS

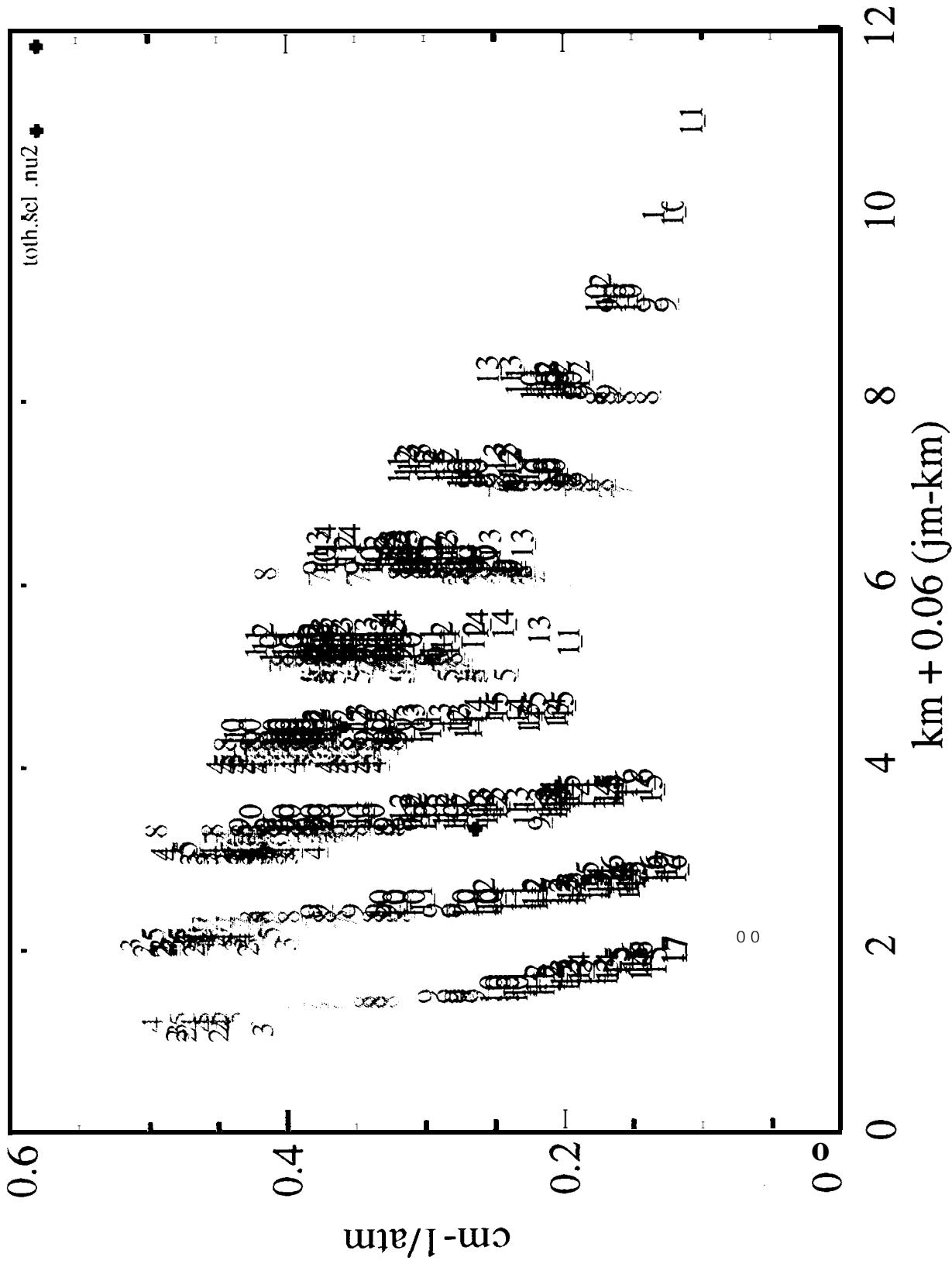
Figure 1. Composite of all observed width parameters  $b^o$  in units of  $\text{cm}^{-1}/\text{atm}$  for the  $\nu_2$  band of  $\text{H}_2^{16}\text{O}$  as function of  $km$  (maximum  $K_a$ ) with  $jm$  (maximum  $J$ ) as the plotting symbols. The **small**( $km-jm$ ) term is used to offset the plot symbols.

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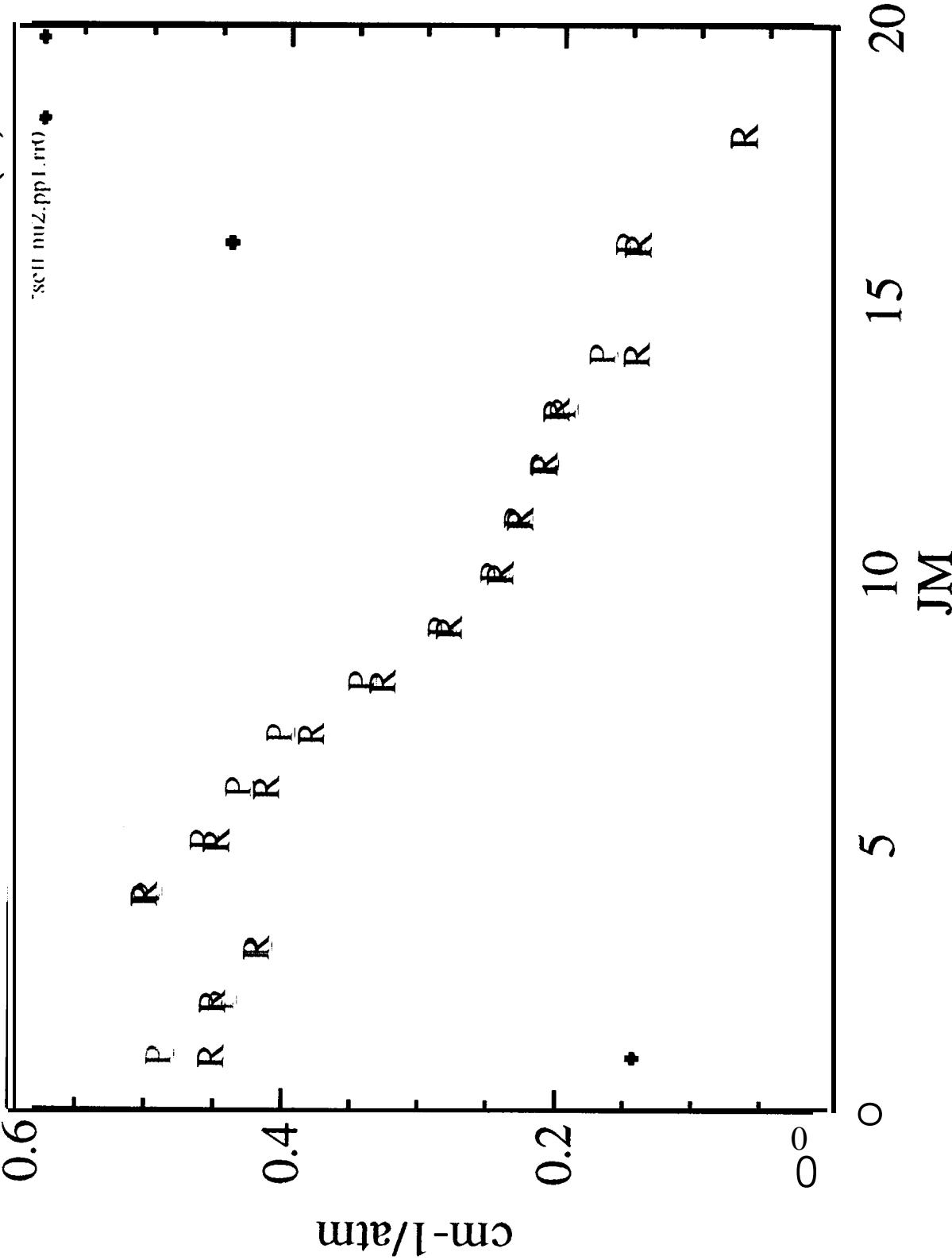
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# SELF BROADENED W DTHS OF WATER

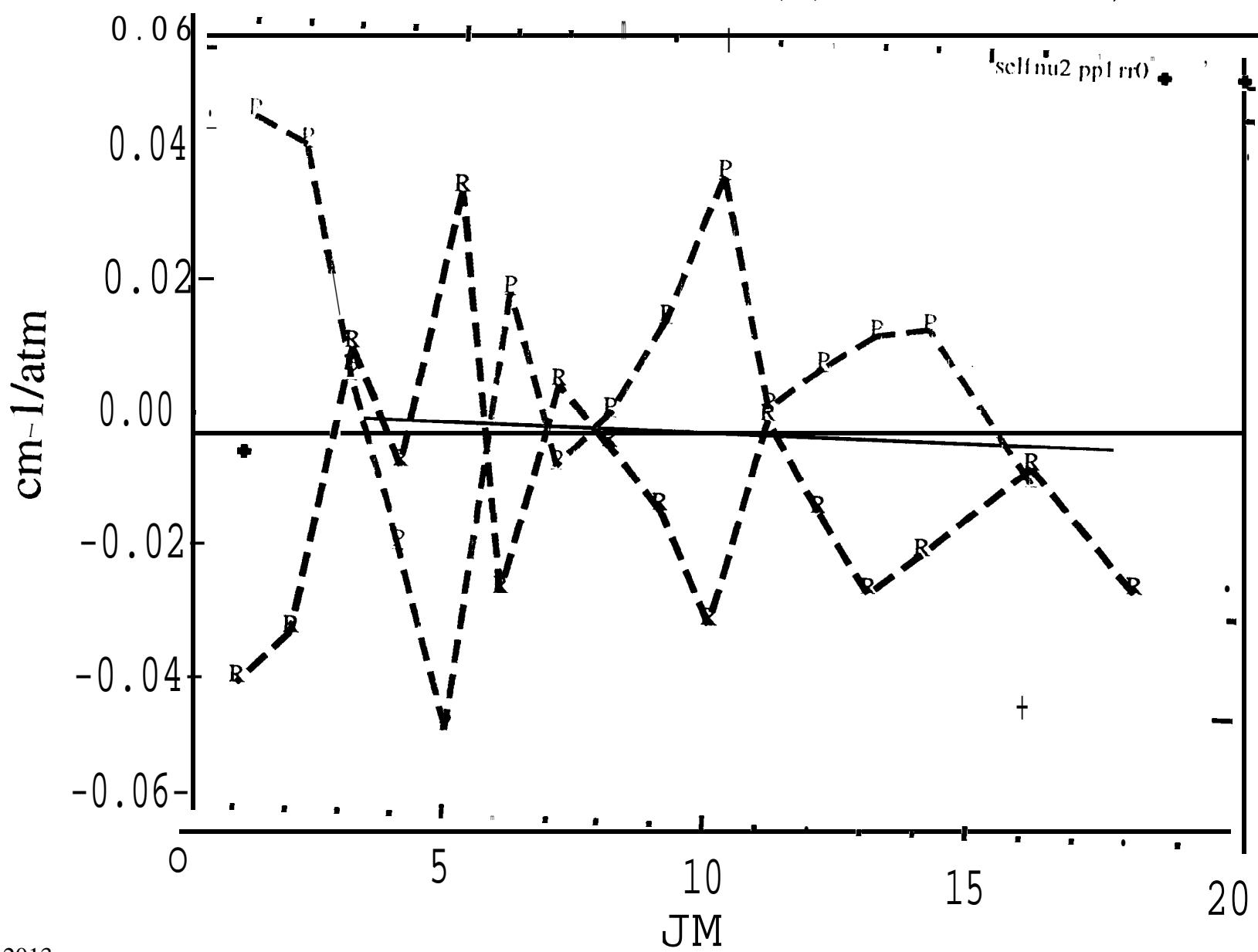


Fri Dec 20 15:06:39 1996

# WIDTHS FOR RR (0) AND PP(1)

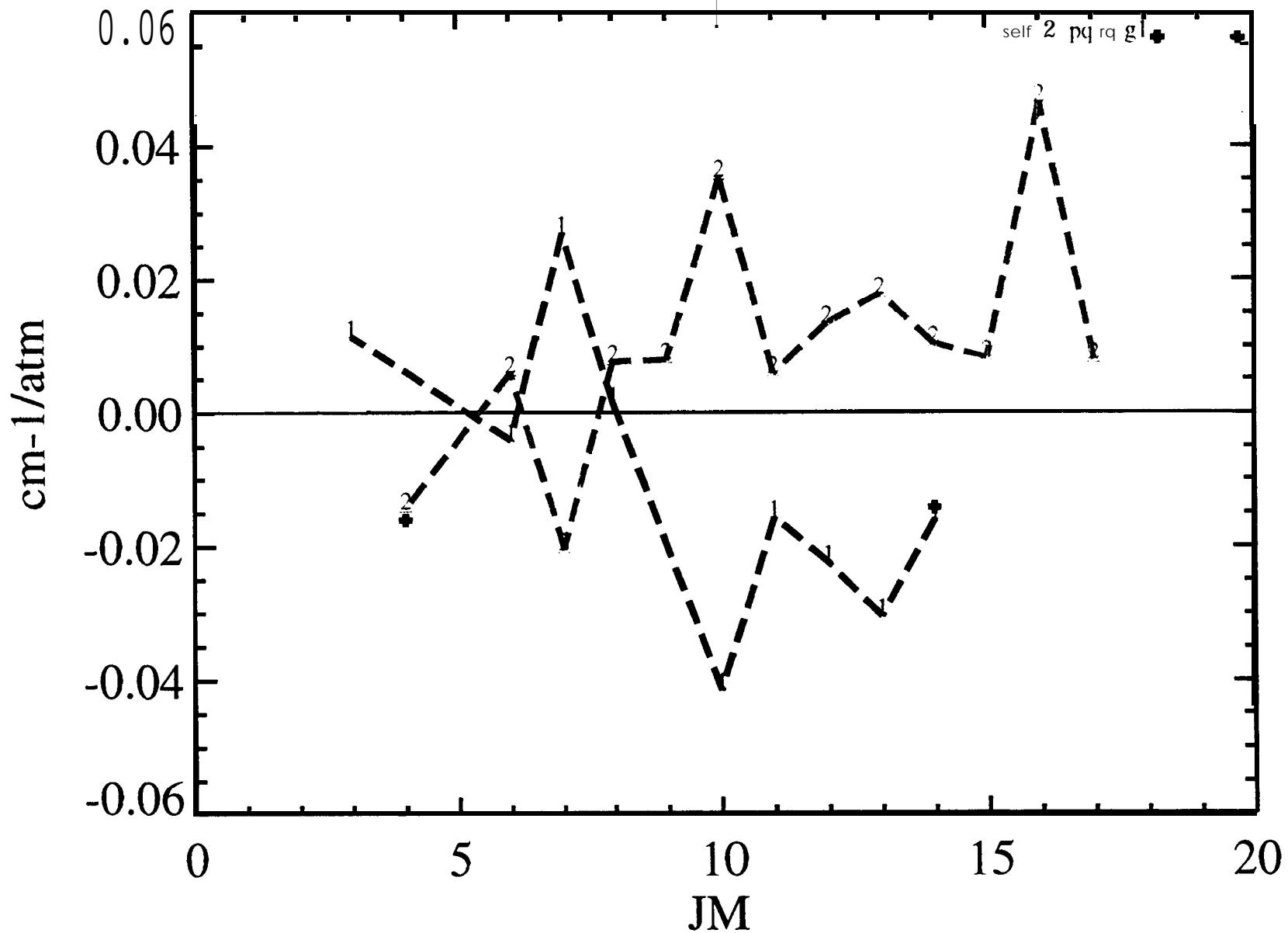


# SHIFTS FOR RR (0) AND PP (1)



Fri Dec 2013: 54:03 1996

# SHIFTS FOR RQ (1) AND PQ (2)



Fri Dec 2014:30:191996



## TABLE TITLES

- Table 1. Experimental conditions of spectra used for the H<sub>2</sub>O self- broadened measurements.
- Table 2. Measured widths b“ (in cm<sup>-1</sup>/atm) and shifts d“ ( cm<sup>-1</sup>/atm x10<sup>5</sup>) of self-broadened water vapor at 296 K.
- Table 3. Comparison of H<sub>2</sub>O self-broadening coefficients for transitions involving the same rotational quantum numbers.
- Table 4. Smoothed values of linewidths b“ (cm<sup>-1</sup>/atm) in which the values do not agree for rotational reversal,
- Table 5. Smoothed values of self-broadened H<sub>2</sub>O widths b“ (cm<sup>-1</sup>/atm) from this work compared to values from other studies (observed).
- Table 6. Comparison of self-broadened widths: ratio of present/prior values

Table 1. Experimental conditions of spectra used for the H<sub>2</sub>O self-broadened measurements.

range of measurements (cm <sup>-1</sup> )	unanodized resolution (cm <sup>-1</sup> )	path length (m)	sample pressure (Torr)	sample temperature (K)
1100 - 2400	0.0054	0.25	17.2	301
1100 - 2400	0.0054	0.25	23.2	301
1100 - 2400	0.0054	0.25	27.5	301
1100 - 2400	0.0054	0.25	29.0	302
1100 - 2400	0.0054	0.25	24.1	302
1100 - 2400	0.0054	1.75	<b>18.7</b>	302
1100 - 2400	0.0054	1.75	23.9	302
1100 - 2400	0.0054	1.75	28.5	302
590 - 2600	0.0053	433	4.83	295
590 - 2600	0.0053	193	4.83	296
590 - 2600	0.0053	25	4.85	296
590 - 2600	0.0053	73	4.86	296

**Table 2.** Measured widths, b<sup>a</sup>, (cm<sup>-1</sup>/atm) and shifts, d<sup>a</sup>, (cm<sup>-1</sup>/atm × 10<sup>3</sup>) of self-broadened water vapor at 296K.

upper J KA KC	lower J KA KC	band	mol.	frequency (computed)	shift (obs.)	width (cm <sup>-1</sup> )	smoothed	BITRAN	BK
4 0 4	3 3 1	(010)-(000)	6	1832.23184	-4005(1017)	0.4473( 8)	0.4380	0.4661	
5 0 5	4 3 2	(010) -[000]	6	<b>1538.24968</b>	-483( 902)	0.4228(246)	0.4180	<b>0.4389</b>	
6 0 6	5 3 3	(010) -{000}	6	1837.81242	-112s( <b>128</b> )	0.4083( 74)	0.4000	0.4291	
6 . 0 8	- 3 5	(010)-(000)	6	1820.76903	-671( 429)	0.3602( 159)	0.3540	0.3841	
9 0 9	4 3 6	{0101}-(000)	6	1806.16689	583( 112)	0.321S( 45)	0.3210	0.3283	
11 0 11	11 3 8	(010)-(000)	6	1469.74608	-SS0( 236)	0.2794( 5)	0.2730	0.2818	
6 1 6	5 4 1	(010)-(000)	6	1432.41210	-S967( 1S7)	0.3742(111)	0.3670	0.4291	
7 1 7	6 4 2	(010)-(000)	6	1423.30967	-2512( 629)	0.3622( <b>58</b> )	0.3610	<b>0.4228</b>	
8 1 8	7 4 3	(010)-(000)	6	1406.42967	707( 236)	0.3972( 40)	0.3900	<b>0.3841</b>	
6 1 5	5 5 2	(010)-(000)	6	1536.14927	-4232( 576)	0.3843( 77)	<b>0.3820</b>	0.4291	
7 1 6	6 4 3	{0101}-(000)	6	1553.00542	-3943( 67)	0.3886( 45)	0.3820	<b>0.4228</b>	
8 1 7	7 4 4	(010)-(000)	6	1562.6101S	-2752( 87)	0.3671( 77)	0.3530	<b>0.3841</b>	
9 1 8	8 4 5	(010)-(000)	6	1565.37140	<b>-1278s( 650)</b>	0.3227( 22)	0.3270	0.3283	
1 0 1 9	5 4 6	(010)-(000)	6	1562.26116	79( 791)	0.3228( 44)	0.3210	0.3009	
7 2 5	6 5 2	(010) -[000]	6	1503.99378	-1963( 236)	0.3687( <b>80</b> )	0.3400	<b>0.4228</b>	
8 2 6	7 5 3	(010)-(000)	6	1536.16627	-ss0( 393)	0.3689( 99)	0.3620	<b>0.3841</b>	
9 2 7	8 5 4	{0101}-(000)	6	1563.23134	-1413( <b>120</b> )	0.3381( 64)	0.3s70	<b>0.3283</b>	
10 2 8	9 5 5	<b>{(010)}-(000)</b>	6	1583.41768	-4s84( 314)	0.385 s(310)	0.3200	0.3009	
3 1 3	2 2 0	(020)-[010]	6	15 S 6.50473	3021( S80)	0.4308( 30)	0.4490	0.4948	0.4937
3 1 3	2 2 0	(010) -[000]	8	3597.47966	1413( 339)	0.4463(128)	0.4490	<b>0.4948</b>	0.4937
3 1 3	2 2 0	(0101)-(0001)	7	1600.23487	628( 314)	0.4590(193)	0.4490	<b>0.4948</b>	0.4937
3 1 3	2 2 0	(020)-(000)	6	1603.31983	1598( 91)	0.4838( 74)	0.4490	<b>0.4948</b>	0.4937
4 1 4	3 2 1	(0201)-(010)	6	1562.36915	1963( 236)	0.4477( 47)	0.4800	0.s003	0.5280
4 1 4	3 2 1	<b>{(010)}-(000)</b>	7	1606.19061	1832( 267)	0.4664(114)	0.4500	0. S003	<b>0.5280</b>
4 1 4	3 2 1	(010)-(000)	6	1609.44050	<b>2660s( 56)</b>	0.4683( 32)	0.4500	0.s003	0.5280
5 1 1	s 4 2 2	(010)-(000)	8	1600.47404	3402( 486)	0.4294( 47)	0.4420	0.458s	0.s071
5 1 5	4 2 2	(010)-(000)	6	1607.04954	4212( 170)	0.4578(125)	0.4420	0.455s	0.5071
6 1 6	5 2 3	(020)-[010]	6	1547.09014	2s12( 502)	0.4233( 2)	0.4400	0.4188	0.4777
6 1 6	5 2 3	(010) -[000]	8	1589.21833	<b>2879s( 928)</b>	0.4133( 94)	0.4400	0.4168	0.4777
6 1 6	5 2 3	(010)-(000)	6	1596.24271	2611( 154)	0.4401(152)	0.4400	<b>0.4188</b>	0.4777
7 1 7	6 2 4	(010)-(000)	6	1578.31644	1247( 256)	0.4539( 201)	0.4370	0.4637	0.4926
9 1 9	8 2 6	(010) -[000]	6	1529.46397	1097( 802)	0.3609( <b>80</b> )	0.3670	0.3930	0.4000
10 1 10	9 2 7	(010)-(000)	6	1503.21810	1126( <b>488</b> )	0.3156(111)	0.3280	0.3359	0.3529
11 1 11	11 2 8	(010)-(0001)	6	1477.92577	3143( 315)	0.2989( <b>57</b> )	0.2920	0.3107	0.3193
3 1 2	2 2 1	(020) -[010]	6	1592.32090	<b>-2118s( 822)</b>	0.4618(134)	0.4680	<b>0.4840</b>	<b>0.5485</b>
3 1 2	2 2 1	(010)-(000)	8	1631.92221	243( <b>150</b> )	0.4661( S5)	0.4680	<b>0.4840</b>	<b>0.5485</b>
3 1 2	2 2 1	(0101) -[000]	7	1634 . S5892	157( 471)	0.4296( 67)	0.4680	<b>0.4840</b>	<b>0.5485</b>
3 1 2	2 2 1	(0101)-(000)	6	1637.51193	<b>407s( 148)</b>	0.4830(122)	0.4680	<b>0.4840</b>	0. S485
4 1 3	3 2 2	(020)-[010]	6	1624.78738	-996( 661)	0.4432( 6S)	0.4370	<b>0.4854</b>	0.s082
4 1 3	3 2 2	(010) -[0001]	8	1663.49794	<b>-884s( 204)</b>	0.4446(162)	0.4370	0.4854	<b>0.5082</b>
4 1 3	3 2 2	(010)-(000)	7	1666.17334	-79( 393)	0.4300( 65)	0.4370	0.4854	0. S082
4 1 3	3 2 2	(010)-(000)	6	1669.16829	<b>47( 195)</b>	0.4363(1661)	0.4370	<b>0.4854</b>	0. S082
5 1 4	4 2 3	(020) -[010]	6	16 S 7.43826	<b>-4914s( 922)</b>	0.4378( 86)	0.s000	0.4946	0.5290
5 1 4	4 2 3	(030) -[000]	8	1694 . 6S673	34s( 119)	0.4s7.7( <b>28</b> )	0.4500	0.4946	0.s390
5 1 4	4 2 3	(100)-[010]	6	1141. s1979	0( 314)	0.4 S7(362)	0.4500	0.4946	0.5290
6 1 5	5 2 4	(020)-[010]	6	1688.92979	-160( 1381)	0.4136( 91)	0.4220	0.4599	0.s101
6 1 S	S 2 4	(010) -[000]	8	1723.92040	-s19( 341)	0.4304( 97)	0.4220	0.4s99	0.s101
6 1 S	S 2 4	(010)-(000)	7	3726.816S2	-2298( 626)	0.4131( S8)	0.4220	0.4899	0.5101
6 1 5	5 2 4	(010) -[0001]	6	1730.0s00s	-1186( 112)	0.4398( 3s)	0.4220	0.4599	0.5101
7 1 6	6 2 2	(020)-[010]	6	1710.05016	65S( 457)	0.3068( SO I)	0.3800	0.42'44	0.4807
7 1 6	6 2 2	(010)-(000)	8	17 30 . 32342	<b>-5212( 173)</b>	0.3932( <b>47</b> )	0.3800	<b>0.4244</b>	<b>0.4507</b>
7 1 6	6 2 2	(010)-(000)	7	17 53.38976	890( 754)	0.393 S(196)	0.3800	0.4244	0.4507
8 1 7	7 3 6	(010)-(000)	8	1773.90787	-361( 441)	0.3179( <b>200</b> )	0.3220	0.3860	<b>0.3858</b>
8 1 7	1 2 6	(010)-(000)	6	1780 . 74591	<b>540s( 110)</b>	0.3322( <b>47</b> )	0.3220	0.3s40	0.3858
9 1 0	8 2 7	(010)-(000)	8	3795.36926	-1743( 461)	0.2761( <b>71</b> )	0.2780	<b>0.3013</b>	0.3136
9 1 8	8 2 7	(010)-(000)	6	1802.47973	-1190( 153)	0.2866( <b>88</b> )	0.2780	<b>0.3013</b>	0.3136
1 0 1 9	9 2 8	(010)-(000)	8	1815.48025	550( <b>550</b> )	0.2300( 37)	0.2450	0.2648	<b>0.2815</b>
1 0 1 9	9 2 8	(010)-(000)	6	1822.76064	<b>368s( 94)</b>	0.26 S7(103)	0.2480	0.2648	0.201s
11 1 10	1 0 2 9	(010)-(000)	8	1834.67404	0( 628)	0.2146(123)	0.2130	<b>0.2172</b>	0.2316
11 1 10	1 0 2 9	(010) -[000]	7	1838.18938	-78s( 942)	0.2041( 10)	0.2130	0.2172	0.2316
1 1 1 1 0	1 0 2 9	(010)-(0001)	6	1842.13070	-131( 169)	0.3216( 30)	0.2130	0.2172	0.2316
12 1 1 1 11	2 10	(010)-(000)	6	1860.91640	-484( 130)	0.196S( <b>27</b> )	0.1920	0.179s	0.1905
1 3 1 2 1 2 2 1 1	1	(010)-(000)	6	1879.29779	-511( 76)	0.1672( 231)	0.1710	0.1445	0.1s33
14 1 1 3 1 3 2 1 2		(0101)-(000)	6	1897.37244	-678( 206)	0.1s31( 32)	0.2530	0.1207	0.0124
15 1 1 4 14 1 1 3		(010) -[000]	6	191 . S19562	<b>-1025s( 251)</b>	0.1474( <b>20</b> )	0.1400	0.1079	
15 1 1 5 1 5 2 1 2 4		(010)-(000)	6	1932.80267	-707( 79)	0.1128( <b>53</b> )	0.1300	0.0880	
17 2 2 16 16 2 1 2S		(010)-(000)	6	19 S 0.22031	-393( 550)	0.1192( 32)	0.1160	<b>0.0718</b>	
4 3 3 3	3 3 0	(010)-(000)	8	1617.3018S	<b>-300s( 14)</b>	0.424 S(347)	0.4180	0.5288	<b>0.4748</b>
4 2 3 3	3 3 0	(010)-(000)	7	1619.80131	<b>864s( 236)</b>	0.4487( 27)	0.4180	0.5208	<b>0.4748</b>
4 2 3 3	3 3 0	(010)-(000)	6	1622. S9777	-921( 96)	0.4112( S7)	<b>0.4180</b>	<b>0.5288</b>	0.4748
5 2 4 4	4 3 1	(010)-(000)	6	1892.59890	-550( 236)	0.368 S(11)	<b>0.4080</b>	0.4267	0.4722
5 2 4 4	4 3 1	(010)-(000)	6	7.640.31015	-860( 64)	0.4207( 85)	0.4080	0.4267	0.4722
6 2 5 2	5 3 2	(020)-[010]	6	160 . S67649	1099( 314)	0.3658( <b>57</b> )	0.4040	0.4436	0.4939
7 2 6 6	6 3 3	(010)-(000)	8	16 S 0.29596	3141( 943)	0.4326( 32)	0.4010	0.4256	0.4642
7 2 6 6	6 3 3	(010)-(0001)	6	16s6 . 99104	2241( 209)	0.4238( 57)	0.4010	<b>0.4256</b>	0.4642
8 2 7	7 3 4	(010)-(000)	6	1652.80927	1350( 403)	0.4060( 97)	0.3970	<b>0.4188</b>	0.4s77
9 2 8	8 3 5	(010)-(000)	6	1640.43600	837( <b>444</b> )	0.3800( 50)	0.3900	<b>0.4011</b>	0.4297
1 0 2 9	9 3 6	(010) -[000]	6	1621.50924	<b>574s( 182)</b>	0.3699( 91)	0.3740	<b>0.3812</b>	0.4012
1 1 2 1 0	1 0 3 7	(010) -[000]	6	1598.26310	-1413( 587)	0.3431( 64)	0.3400	0.3724	<b>0.3807</b>
22 2 1 1 1	1 3 8	(010)-(000)	6	1573 . 1S610	-2178( 79)	0.3034( S)	0.3000	0.3s81	0.3476
4 2 2 2	3 3 1	(020)-[010]	6	1588.48718	-4083( 314)	0.4026( 48)	0.4200	0.4355	0.4689
4 2 2 2	3 3 1	(010)-(0001)	8	1632.78633	-1492( 580)	0.3912(105)	<b>0.4200</b>	0.4355	0.4689
4 2 2 2	3 3 1	(010)-(000)	6	1637.68176	<b>-1892s( 252)</b>	0.4226( <b>86</b> )	0.4200	0.4355	0.4689
5 2 3 4	4 3 2	(0-J 0)-(010)	6	1622.10646	-1256( 314)	0.4053(131)	0.4370	0.4159	0.4690
5 2 3 4	4 3 2	(010)-(000)	8	1666.63105	<b>-1148s( 343)</b>	0.4238(154)	0.4370	<b>0.4159</b>	0.4690
6 2 4 4	5 3 3	[020)-(0101	6	1658.27140	-1256( 785)	0.427S( 2S)	0.4300	0.4536	0.s033
6 2 4 4	5 3 3	(010)-(0001)	8	1702.39648	1727( 314)	0.3983( 67)	0.4300	0.4536	0. S033
6 2 4 4	5 3 3	(010)-(000)	6	1707 . >2252	<b>1978s( 158)</b>	0.4193( 61)	0.4300	0.4536	0.5033
7 2 5 6	6 3 4	(0101)-(000)	8	1738.65936	1107( 528)	0.4120(242)	0.4		

table 2. Continued

upper J KA KC	lower J KA KC	band	mol.	frequency (computed)	shift (obs.)	width obs.)	width		B1TRAN	BK
							smoothed			
14 2 13	13 3 11	(010)-(000)	6	1935.32451	-388( 403)	0.1899( 86)	0.1800	0.1856	0.0188	
15 2 13	14 3 12	(010)-(000)	6	195s.2s038	-896( 552)	0.1578( 70)	0.1570	0.1407		
5 3 3	4 4 0	(C10)-(000)	8	1633 .46596	-1413( 283)	0.3210( 8)	0.3400	0.3739	0.3987	
5 3 3	4 4 0	(C10)-(000)	6	1638.27353	-756( 171)	0.3364( 92)	0.3400	0.3739	0.3987	
6 3 4	5 4 1	(010)-(000)	8	1656.42459	-2041( 214)	0.3229( 65)	0.3490	0.3920	0.4229	
6 3 4	5 4 1	{010}-(000)	7	1658.76047	-2827( 786)	0.3255( 67)	0.3490	0.3920	0.4229	
6 3 4	5 4 1	(010)-(000)	6	1661.37105	-3461( 116)	0.3378( 83)	0.3490	0.3920	0.4229	
7 3 5	6 4 2	(010)-(000)	8	1676.94752	-2277( 550)	0.3618(114)	0.3530	0.3843	0.4132	
7 3 5	6 4 2	(010)-(000)	6	1682.17424	-2552( 67)	0.3701( 44)	0.3530	0.3843	0.4132	
8 3 6	7 4 3	(0101)-(0001)	8	1693.22151	3690( SS0)	0.3s24( 54)	0.3670	0.3842	0.4118	
8 3 6	7 4 3	[010]-(000)	6	1698.95540	1256( 221)	0.3803(138)	0.3670	0.3842	0.4118	
10 3 8	9 4 5	(010)-(000)	6	1712.49104	2602( 96)	0.3786( 32)	0.3720	0.4044	0.4091	
11 3 9	1 0 4 6	(010)-(000)	6	1706.81678	4476( 79)	0.3614(167)	0.3640	0.3898	0.4018	
12 3 10	1 1 4 7	(010)-(000)	6	1693.41S74	-170(4855)	0.3686 [108]	0.3570	0.3848	0.39S9	
5 3 2	4 4 1	(020)-(010)	6	1593.13182	-1492( 79)	0.3203( 47)	0.3640	0.3875	0.4262	
3 3 1	4 4 1	(010)-(000)	6	1642.38655	-2243( 96)	0.2735( 64)	0.3640	0.3875	0.4262	
6 3 3	5 4 2	(010)-(000)	6	1672.47517	-3488( 335)	0.3879( 95)	0.3910	0.4038	0.4581	
7 3 4	6 4 3	(010)-(000)	6	1706.15050	-3375( 173)	0.4006( 70)	0.4060	0.4300	0.4683	
9 3 6	8 4 5	(010)-(000)	6	17 81.96192	-630( 62)	0.4168( 97)	0.4080	0.4248	0.4417	
10 3 7	9 4 6	(0101)-(000)	6	1821.37404	2229( 149)	0.3977( 32)	0.3970	0.4554	0.4506	
11 3 8	1 0 4 7	(010)-(0001)	6	1859 .70356	-817( 43)	0.3612( 44)	0.3630	0.3916	0.4016	
12 3 5	1 1 4 8	(0101)-(000)	6	1895.51362	-3237( 88)	0.3282(15.9)	0.3200	0.3365	0.3479	
13 3 10	1 2 4 9	(010)-(000)	6	1927 .85954	-3660( 188)	0.2821( 82)	0.2750	0.2709	0.2763	
14 3 11	13 4 10	(010)-(000)	6	1956.58317	-1335( 236)	0.2262( 38)	0.2210	0.2123		
15 3 12	14 4 11	(010)-(000)	6	1982.19778	-3141( 472)	0.1942( 86)	0.1900	0.1888		
6 4 3	5 s 0	(C10)-(000)	6	1656.30520	-2001( 93)	0.2777( 91)	0.2810	0.2862		
7 4 4	6 5 1	(010)-(000)	6	1680.87534	-1888( 73)	0.2800( 71)	0.2840	0.3102		
0 4 5	1 s 2	(010)-(000)	6	1704.86199	-3132( 385)	0.2856(1231)	0.2910	0.3156		
9 4 6	8 5 3	(010)-(000)	6	1727.41151	-1901( 104 I)	0.3178( 53)	0.3100	0.3580		
10 4 7	9 s 4	(010)-(000)	6	3.747.24925	-1291( 260)	0.3268(108)	0.3360	0.3510		
11 4 8	10 s 5	(010)-(000)	6	1762.69385	-650( 500)	0.3520( 80)	0.3520	0.3618		
1 1 4 9	1 1 s 6	(010) -[000]	6	1771.88358	-471( 628)	0.3628( 64)	0.3620	0.3807		
6 4 1	5 5 1	(010)-(000)	6	16 S.09243	-1196( 162)	0.2830(126)	0.2780	0.3205	0.3S23	
1 4 3	6 s 2	(010)-(000)	6	1683.54039	1057( 207)	0.3093( 77)	0.3100	0.3636	0.3824	
. s 4 4	7 s 3	(010) -[-000]	6	1712.04351	1010( 105)	0.3599( 55)	0.3460	0.3594	0.3967	
10 4 6	9 s 5	(010)-(0001)	6	1770.75723	-300( 2S0)	0.3887( 7s)	0.3880	0.413s	0.42S3	
1 1 4 1	1 0 s 6	(010)-(0001)	6	1817.15173	-477( 599)	0.3779(142)	0.3700	0.4421	0.4464	
1 2 4 8	11 5 7	(010)-(000)	6	1857.62562	1570( 471)	0.3542( 5)	0.3500	0.4275	0.4351	
13 4 9	1 2 s 8	(010)-(0001)	6	1898.66567	0( 1s7)	0.31s5( 54)	0.3100	0.3728	0.3836	
7 5 3	6 6 0	(010)-(000I)	6	1670.98308	-110( 362)	0.2320{ 77}	0.2320	0.2509	0.2648	
8 5 4	7 6 1	(010) -[-000]	6	1703.43048	-600( 8S)	0.22S7( 16)	0.2210	0.2732	0.2908	
9 5 s	8 6 2	(010)-(000)	6	1727.83392	-1089( 315)	0.2298( 4S)	0.2320	0.3080		
1 0 5 6	9 6 3	{010) -[-000}	6	1751.88247	-2259( 1361)	0.2468( 40)	0.2420	0.3289	0.3137	
7 5 2	6 6 1	(010)-(000)	6	1679.10919	-3[ 87)	0.2375( 43)	0.2400	0.2566	0.2709	
8 5 3	7 6 2	(010)-(000)	6	1703.94224	-25s( 224)	0.2480( 30)	0.2480	0.2841	0.3041	
9 5 4	8 6 3	(0101)-(0001)	6	1729.434s9	675( 136)	0.2435( 68)	0.2680	0.3123	0.3226	
1 0 5 s	9 6 4	(0101)-(0001)	6	17 S.15521	90( 128)	0.2909(154)	0.1900	0.3459	0.3489	
1 2 5 7	1 1 6 6	(010)-(000)	6	1816.65577	-314( 471)	0.3283( 68)	0.3200	0.3756	0.3893	
13 5 8	1 2 6 7	(010)-(000)	6	18s1.84713	-1884( 471)	0.3133( 99)	0.3100	0.3859	0.3962	
1 0 6 5	9 7 2	(010)-(000)	6	1754.11715	-1256( 499)	0.2131(119)	0.2300	0.2s11	0.2s20	
1 1 1	0 0 0	(020)-(010)	6	1601.34703	-4043( 403)	0.4424( S4)	0.4800	0. S134	0. S026	
1 1 1	0 0 0	(010)-(000)	7	1631.31501	-6300( 312)	0.4601( SS)	0.4800	0. s134	0. S026	
2 1 2	1 0 1	(020)-(010)	6	1619.36015	-16.80( 62)	0.4465( 53)	0.4190	0.5000	0.4996	
2 1 1	1 0 1	(010)-(000)	8	1646.28221	-2725( S93)	0.4193(143)	0.4190	0.5000	0.4996	
2 1 2	1 0 1	(010)-(000)	7	1649.57383	-3253( 172)	0.4418( 4)	0.4190	0.5000	0.4996	
3 1 3	2 0 2	(010)-(000)	8	1662.33833	1089( 16)	0.414s( 43)	0.4220	0.4444	0.4804	
3 1 3	2 0 2	(010)-(000)	7	1665.66108	971( 39s)	0.4157( 70)	0.4220	0.4444		
3 1 3	2 0 2	(010)-(000)	6	2131.57504	-707( 236)	0.40 S9(146)	0.4220	0.4444	0.4804	
4 1 4	3 0 3	(020)-(010)	6	1649 .80758	2881( 56)	0.4074( 41)	0.4830	0.s201	0. S659	
4 1 4	3 0 3	(010)-(000)	8	1677.75049	-681( 44)	0.4917( 32)	0.4830	0.s201	0. S689	
4 1 4	3 0 3	(100)-(010)	6	2145.67852	1832( 534)	0.4934( 69)	0.4830	0.6201	0.56S9	
5 1 5	4 0 4	(020)-(010)	6	1665.02900	S288( 70)	0.4361( S4)	0.4580	0.4750	0. S172	
5 1 5	4 0 4	[010)-(000)	8	1693.69951	2972( 94)	0.4508( 17)	0.4550	0.4750	0. S172	
5 1 5	4 0 4	(010)-(000J)	7	1697.03399	2953( 577)	0.4460(168)	0.4550	0.4750	0.5172	
5 1 5	4 0 4	(010)-(000)	6	1700.77632	3490( 733)	0.4400(410)	0.4550	0.4750	0.5172	
5 1 5	4 0 4	(100)-(010)	6	2160.00526	4790( 5s0)	0.4487[ 17)	0.4550	0.4750	0.5172	
6 1 6	5 0 5	[010)-(0001)	8	1710.33016	-1630( 88)	0.4230( 80)	0.4220	0.4502	0.47s7	
6 1 6	5 0 5	(010)-(000)	7	1713.66410	-1945( 94)	0.4275( S7)	0.4220	0.4502	0.4757	
6 1 6	5 0 5	(100)-(010)	6	2175.03674	-1s701( 314)	0.4213( 23)	0.4220	0.4502	0.47s7	
7 1 7	6 0 6	(020)-(010)	6	1697.73827	142s( 476)	0.3421(103)	0.3620	0.4335	0.4095	
7 1 7	6 0 6	(010)-(000)	8	1727.29701	634( 123)	0.3719( 53)	0.3620	0.433s	0.409s	
7 1 7	6 0 6	(010)-(000)	7	1730.64106	612(1022)	0.3602(212)	0.3620	0.4335	0.4095	
8 1 8	7 0 7	(020)-(010)	6	1714.61004	536( 237)	0.3200	0.3107	0.3432		
8 1 8	7 0 7	(010)-(000)	8	1744.20822	-304( 346)	0.3229( S4)	0.3200	0.3107	0.3432	
8 1 8	7 0 7	(010)-(000)	6	1751.42329	-251( no)	0.3200(299)	0.3200	0.3107	0.3432	
8 1 8	7 0 7	[100)-(010)	6	2206.42000	-1335( 550)	0.3234(1431)	0.3200	0.3107	0.3432	
9 1 9	8 0 8	[020)-(010)	6	1731.46770	-598( 343)	0.2723( 61)	0.2670	0.2762	0.2853	
9 1 9	8 0 8	(010)-(000)	8	1761.12848	-1468( 228)	0.2661(125)	0.2670	0.2762	0.2853	
9 1 9	8 0 8	(010)-(000)	6	1768.31202	-1179( 184)	0.2712(221)	0.2670	0.2762	0.2853	
10 1 1 0 9 0 9		(020)-(010)	6	1740.18397	-2440( 502)	0.2314( 74)	0.2330	0.217s	0.2369	
10 1 1 0 9 0 9		(010)-(000)	8	1777.73559	-2810( 18)	0.2330	0.217s	0.2369		
10 1 1 0 9 0 9		(010)-(000)	7	1781.14545	-2348( 336)	0.2110( 73)	0.2330	0.217s	0.2369	
11 1 11 10 0 10		(010)-(000)	6	1801.36212	230( 1s2)	0.2207( 54)	0.3200	0.1827	0.2048	
12 1 2 1 1 0 1 1		(010)-(000)	8	1810.12905	-979( 471)	0.1805(134)	0.2070	0.1701	0.1855	
12 1 2 1 1 0 1 1		(010)-(000J)	7	1813.56764	-2512( 314)	0.1857( 8)	0.2070	0.1701	0.1855	
12 1 2 1 1 0 1 1		(010)-(000)	6	1017.46882	-1122( 185)	0.2035( 17)	0.2070	0.1701	0.1855	
13 1 13 12 0 12		(010)-(0001)	6	1833.28624	-2318( 889)	0.1951( 66)	0.1900	0.1446	0.1s11	
1 6 1 1 6 1 5 0 1 5		(010)-(000)	6	1879.01940	-343( 88)	0.1370( 60)	0.1300	0.0874		
2 0 2	1 1 1 1	(020)-(010)	6	1586.99407	3639( 386)	0.4474(135)	0.4380	0.4756	0.5069	
2 0 2	1 1 1 1	(010)-(000)	8	1621 .58825	<b>1220( ala)</b>	0.4426( 2s)	0.4380	0.4756		

table 2. continued

upper J KA KC	lower J KA KC	band	mol.	frequency (computed)	shift (obs.)	width (obs.)	• smooth	HITRAN	BK
5 0 5	4 1 4	(C20)-(010)	6	16 S7.38969	1S46( 701	0.4350( S7)	0.4370	0.4809	0.5075
5 0 5	4 1 4	(C10)-(000)	8	1609.19409	2379( 229)	0.4490(115)	0.4370	0.4809	0.s075
5 0 s	4 1 4	(C10)-(000)	7	1692.36935	2294( 140)	0.4541( 43)	0.4370	0.4809	0.s075
5 0 5	4 1 4	(100)-(010)	6	21 S4.71130	1570( 471)	0.4264(105)	0.4370	0.4809	0.s075
6 0 e	5 1 5	(C20)-(010)	6	1677.22329	-2445( 179)	0.3729(103)	0.4000	0.4130	0.4667
6 0 e	5 1 5	(C10)-(000)	8	1708.27296	-3279( 48)	0.4003( 41)	0.4000	0.4130	0.4667
6 0 e	5 1 5	(C10)-(000)	7	1711 .s1753	-3564( 164)	0.4016(134)	0.4000	0.4130	0.4667
6 0 .	s 5 1 5	(C10)-(000)	6	171 S1.8806	-35s5( 102)	0.3839(337)	0.4000	0.4130	0.4667
7 0 -	6 1 6	(C10)-(000)	8	1726.39451	252( 68)	0.3586(166)	0.3630	0.3934	0.3967
7 0 7	6 1 6	[100)-(010)	6	2189.43117	-1021( 864)	0.3511( 27)	0.3630	0.3934	0.3967
8 0 e	7 1 7	(C20)-(010)	6	1713.70907	53s(10ss)	0.3360(246)	0.3180	0.3136	0.3432
8 0 e	7 1 7	(010)-(0001)	8	1743.8985s	187( 123)	0.3270(106)	0.3180	0.3136	0.3432
9 0 s	8 1 8	(020)-(010)	6	1731.03699	-1286( 358)	0.2699( 43)	0.2770	0.2751	0.2648
9 0 5	6 1 8	(010)-(0001)	8	1760.96062	-1686( 128)	0.2736( 51)	0.2770	0.2781	0.2048
9 0 s	6 1 8	(C10)-(000)	7	1764.33499	-961( 103)	0.2756( 32)	0.2770	0.2781	0.2048
10 0 1c	9 1 9	(C20)-(010)	6	1747.97614	-1817( 367)	0.2392(143)	0.2400	0.2168	0.2368
10 0 1c	9 1 9	(C10)-(000)	8	1777.66254	-2071( 824)	0.2252(123)	0.2400	0.2168	0.2368
10 0 1c	9 1 9	(C10)-(000)	6	1764.88687	-3125( 134)	0.2272(191)	0.2400	0.2168	0.2368
11 0 1:	10 1 10	(C20)-(010)	6	1764.59770	-181( 6481	0.2174( 51)	0.2130	0.1828	0.2046
11 0 11	10 1 10	(C10)-(000)	8	1794.04169	-262( 382)	0.2092(105)	0.2130	0.1828	0.2046
11 0 1:	10 1 10	(C10)-(000)	6	1601.32447	-195( 301)	0.2292(120)	0.2130	0.1828	0.2046
12 0 12	11 1 11	(C10)-(000)	8	1810.11466	-1570(1099)	0.1832( 47)	0.1920	0.1707	0.0156
12 0 12	11 1 11	(C10)-(000)	6	1017.45168	-1 S30( 423)	0.2046( S4)	0.1920	0.1707	0.0186
13 0 13	12 1 12	(C10)-(000)	8	1825.89055	-1728(1728)	0.1582( 2)	0.1700	0.1448	0.1511
13 0 13	12 1 12	(C10)-(000)	6	1833.27846	-1950( 200)	0.1812( 77)	0.1700	0.1448	0.1s11
15 0 15	14 1 14	(010)-(000)	6	1864.05587	1116( 381)	0.1398( 18)	0.1480	0.0910	
17 0 17	16 1 16	(C10)-(000)	6	1893.70661	-1350( 100)	0.1145( 5)	0.1200	0.0743	
2 2 1	1 1 0	(C10)-(000)	8	1692.19509	4364( 62)	0.4688( 18)	0.4850	0.5102	0.5256
2 2 1	1 1 0	(100)-(010)	6	2148.18853	3978(1075)	0.4689(100)	0.4850	0.5102	0.5256
3 2 2	2 1 1	(020)-(010)	6	1694.03069	2516( 308)	0.4184( 67)	0.4380	0.4419	0.4739
3 2 2	2 1 1	(010)-[000]	8	1710.78607	1877( 644)	0.4356( 40)	0.4380	0.4419	0.4739
3 2 2	2 1 1	(010)-(000)	7	1714.47353	2376(1022)	0.4241(111)	0.4380	0.4419	0.4739
3 2 2	2 1 1	(010)-(OOD)	6	1718.61168	2340( 90)	0.4300(4201	0.4380	0.4419	0.4739
4 2 3	3 1 2	(010)-(000)	8	1726.72603	1407( 113)	0.4760( 45)	0.4670	0.4629	0.5376
4 2 3	3 1 2	(010)-(000)	7	1730.4 S898	633(1471)	0.4659(172)	0.4670	0.4829	0.5376
4 2 3	3 1 2	IO1O)-(0001	6	1734 .6 S058	1233( 420)	0.4500(400)	0.4670	0.4829	0.5376
5 2 4	4 1 3	(020)-(010)	6	1723.04625	1771( 852)	0.4350( 27)	0.4620	0.4959	0.5355
5 2 4	4 1 3	(010)-(0001)	8	1740.65075	1391( 306)	0.4702(134)	0.4620	0.4959	0.535s
5 2 4	4 1 3	(010)-(000)	6	1748.6S566	1412( 565)	0.4879(347)	0.4620	0.4959	0.535s
6 2 5	5 1 4	(020)-(010)	6	173 S.30776	582( 306)	0.4232( 71)	0.4400	0.4590	0.5202
6 2 5	5 1 4	(010)-(000)	8	173 S.382160	203( S9)	0.4274( SS)	0.4400	0.4590	0.s202
6 2 s	5 1 4	(010)-(000)	7	1757.59202	73( 402)	0.4304( 89)	0.4400	0.4590	0.s202
7 2 6	6 1 S	(020)-IO10	6	1747.90406	13s6( 631)	0.3463(2161	0.4030	0.4300	0.4727
7 2 6	6 1 5	(010)-(0001)	8	1767.72589	1588( 497)	0.3843(206)	0.4030	0.4300	0.4727
7 2 6	6 1 5	(010)-(000)	6	1775.63419	1625( 230)	0.4039( 71)	0.4030	0.4300	0.4727
8 2 7	7 1 6	(010)-(000)	8	1783.18295	1344( 154)	0.3473( 73)	0.3s00	0.3667	0.3903
8 2 7	7 1 6	(010)-(000)	6	1790.95183	911( 88)	0.3655( 77)	0.3s00	0.3667	0.3903
9 2 8	8 1 7	(010)-(000)	8	1000.03872	-79( 550)	0.3172( 2)	0.3130	0.3619	0.3610
9 2 6	8 1 7	(010)-(000)	6	1807.70333	-881( 73)	0.3203( 45)	0.3130	0.3619	0.3610
1 0 2 9	9 1 8	(010)-IO001	8	1817.72900	186( 324)	0.2441(122)	0.2570	0.2698	0.2790
3 0 2 9	9 1 8	(010)-IO001	7	1s21. 31000	-1204( 392)	0.2424( 20)	0.2870	0.2698	0.2790
1 0 2 9	9 1 8	(010)-(000)	6	1825.34878	469( 168)	0.2623( 47)	0.2570	0.2698	0.2790
1 1 2 1 0	1 0 1 9	(010)-(0001)	6	1843.39438	-295( 47)	0.2239( 22)	0.2130	0.2193	0.2362
1 2 2 1 1	1 1 1 1 0	(010)-[000]	8	1653.87481	-785( 314)	0.1909( 27)	0.1920	0.1834	0.1969
12 2 1 11	1 1 10	(010)-[000]	6	1861.53156	-279( 61)	0.2025( 25)	0.1920	0.1834	0.1969
1 3 2 1 2 1 2	2 1 1 11	(010)-(000)	6	1879.59883	-434( 16)	0.1731( 8)	0.1600	0.1424	0.1520
14 2 13	13 1 12	(010)-(000)	6	1897.52131	-652( 68)	0.1s48( 12)	0.1s20	0.1203	0.1255
15 2 14	13 1 13	(010)-(000)	6	191 S.270370	-1747( 692)	0.1429( S4)	0.1420	0.1066	
1 6 2 1 5 1 5 1 1 4	(010)-[000]	6	1932.84088	-1910( 434)	0.1255( 74)	0.1300	0.0847		
2 2 0	1 1 1	(020)-(010)	6	1682.24352	1447( 419)	0.4351(114)	0.4500	0.4850	0. S072
2 2 0	1 1 1	(010)-(000)	7	1702.29737	636( S52)	0.4526(122)	0.4500	0.4850	0. S072
3 2 1	2 1 2	(020)-(010)	6	1715.68792	1011( 280)	0.4654( 44)	0.4600	0.5241	0.5262
3 2 1	2 1 2	(010)-(0001)	8	1732.30197	2774( 229)	0.4651( 54)	0.4600	0.5241	0. S262
3 2 1	2 1 2	(010)-[000]	7	1735.8s171	2726( 522)	0.4675(106)	0.4600	0.5241	0. S262
4 2 2	3 1 3	(020)-(010)	6	1756.45548	707( 550)	0.4456( 1)	0.4220	0.4430	0.4955
4 2 2	3 1 3	(010)-(000)	6	1780.62266	1969( 111)	0.4234( 20)	0.4220	0.4430	0.49ss
S 2 3	4 1 4	(020)-(010)	6	1805.32356	2615( 407)	0.4557(120)	0.4600	0.4727	0. S214
5 2 3	4 1 4	(010)-[000]	8	1822.09412	-21( 11s)	0.4769( 181)	0.4600	0.4727	0.5214
5 3 3	4 1 4	(010)-(000)	6	1829.13039	1201( 85)	0.4605( 71)	0.4600	0.4727	0. S214
6 2 4	5 1 5	(020)-(010)	6	1861.8s008	-1492( 864)	0.4543( 37)	0.4420	0.4738	0.5327
6 2 4	5 1 5	(010)-(0001)	8	1877.77701	-1649( 864)	0.4210( 6)	0.4420	0.4738	0. S327
6 2 4	5 1 5	(010)-(0001)	6	16.04.56518	-985( 107)	0.4604(128)	0.4420	0.4738	0.5327
7 2 5	6 1 6	(020)-[010]	6	1924.73S14	2277( 550)	0.4176( 20)	0.4160	0.4588	0.4889
7 2 5	6 1 6	(010)-(000)	6	1938.6s976	680(1028)	0.4040( 32)	0.4180	0.4588	0.4889
7 2 5	6 1 6	(010)-(000)	6	1945.34028	1439( 100)	0.4246( 67)	0.4180	0.4588	0.4889
8 2 6	7 1 7	(010)-(000)	6	2009.33384	1014( 58)	0.4100( 54)	0.4080	0.4085	0.4412
9 2 7	8 1 8	(010)-(000)	6	2074 .23545	-3s06( 145)	0.3752( 44)	0.3680	0.3060	0.3875
1 0 2 0 9 1 9	(010)-(000)	6	2138.10844	-2940( 450)	0.31 S4(102)	0.3110	0.3352	0.3394	
1 1 2 9 1 0 1 1 0	(010)-[010]	6	609.71602	-1466( 1996)	0.3037(161)	0.2720	0.2465	0.2635	
11 2 9 3 0 1 1 0	(010)-(000)	6	2200.30577	-116( 736)	0.2680(1511)	0.2720	0.2465	0.2635	
12 2 10 11	1 1 11	(000)-(000)	8	631.21763	-1021( 236)	0.2515( 13)	0.2400	0.1995	0.2224
1 4 2 1 2 1 3 1 1 3	(000)-(000)	6	744.21083	-589( 204)	0.2231(132)	0.2180	0.1448	0.0150	
15 2 13 14	1 1 14	(000)-(0001)	6	798.75865	-1779( 370)	0.2067( 66)	0.2050		
16 2 14 15	1 1 s	(0001)-(000)	6	052.7s425	-4031( 267)	0.1574( 79)	0.1610		
17 2 15	16 1 16	(000)-(000)	6	906.22807	-5810( 222)	0.1484( 44)	0.1400		
3 3 1	2 2 0	(020)-(010)	6	1757.02473	3932( 151)	0.4075( 5)	0.4200	0.4839	0.4601
3 3 1	2 2 0	(010)-(000)	8	3762.6s6971	4272( 599)	0.4302(125)	0.4200	0.4839	0.4601
3 3 1	2 2 0	(010)-(0001)	7	1766.72817	4283( 504)	0.4372( 44)	0.4200	0.4839	0.4601
4 3 2	3 2 1	(020)-(010)	6	1778.53096	4504( 146)	0.4062( 55)	0.4380	0.4451	0.47s3
4 3 2	3 2 1	(010)-(000)	8	1783.90403	4699( 47)	0.4392( 48)	0.4380	0.4451	0.4753
4 3 2	3 2 1	(010)-(000)	7	1708.02753	4259( 536)	0.4364( 38)	0.4380	0.4451	0.4753
4 3 2	3 2 1	(010)-(000)	6	1792.6s940	4402( 129)	0.4063(400)	0.4380	0.4451	0.4753
S 3 3	4 2 2	(020)-(010)	6	1796.591					

table 2. continued

<b>upper</b>	<b>lower</b>				<b>frequency</b>	<b>shift</b>	width			
J KA KC	J KA KC	band	mol.	(computed)	lobes.)	(obs.)	smoothed	HITRAN	BK	
7 3 s	6 2 4	[010)-(000)	8	1827.89718	785( 314)	0.4172( 94)	0.4220	0.4536	0.4921	
7 3 5	6 2 4	[010)-(000)	7	1832.26627	314( 1S7)	0.4322( 13)	0.4220	0.4336	<b>0.4921</b>	
7 3 S	6 2 4	(010)-(000)	6	1837.18101	16S1( 67)	0.4241( 12)	0.4220	0.4336	0.4921	
<b>8 3 6</b>	<b>7 2 5</b>	(020) - [010]	6	1831.99400	-157( 314)	0.3680( 75)	0.3s. 80	0.4240	0.4614	
<b>8 3 6</b>	<b>7 2 5</b>	(010)-(000)	8	1838.46846	<b>2559( 524)</b>	0.3916(166)	0.3050	0.4248	0.4614	
8 3 6	7 2 5	[010)-(000)	6	1847.78281	296S( <b>62</b> )	0.3813( 13)	0.3080	0.4248	0.4614	
9 3 7	8 2 6	(020)-(010)	6	1841.12749	-1492(1335)	0.3 800(106)	0.3620	0.4233	0.4287	
9 3 7	8 2 6	(010)-(000)	8	<b>1849.33870</b>	628( 801)	0.3561( 40)	0.3620	0.4233	0.4287	
9 3 7	8 2 6	(010)-(000)	6	1888. s1910	1393( 129)	0.3940( 97)	0.3620	0.4233	<b>0.4287</b>	
<b>10 3 8</b>	9 2 7	[020)-(010)	6	1851.33787	-290S( 393)	0.3237( 0)	0.3s00	0.3971	0.3924	
<b>10 3 8</b>	9 1 7	(010)-(000)	6	1870.80468	<b>1890( 91)</b>	0.3506( 67)	0.3500	0.3971	0.3924	
1 1 3 9	1 0 2 8	(010)-(000)	6	1885.30129	1381( 133)	0.3026(114)	0.3040	0.3529	0.3465	
12 3 10	1 1 2 9	(010)-(000)	6	1901.75952	582( 138)	0.2667( 79)	0.2520	0.2482	0.3609	
13 3 11	12 2 10	(010)-(000)	6	1919. S1339	1057( 480)	0.2110( 30)	0.2100	0.2119	0.2205	
<b>14 3 12</b>	<b>13 2 11</b>	(010)-(000)	6	1937.94653	-410( 140)	0.1939( 45)	0.1920	0.1858	<b>0.1883</b>	
15 3 13	<b>14 2 12</b>	(010) - [000]	6	19 S6.64010	<b>-628( 157)</b>	0.1632( 5)	0.1s80	0.1372		
16 3 14	15 2 13	(010)-(000)	6	197s.34794	-1884( 471)	0.1478( 41)	0.1400	0.1173		
<b>3 3 C</b>	<b>2 2 1</b>	(020)-(010)	6	1758.33308	1847( 1621)	0.3649( 67)	0.4330	0.s173	0.5075	
3 3 C	<b>2 2 1</b>	(010)-(000)	8	1764.15144	4625( 113)	0.4341( 44)	0.4330	0.s173	0.5075	
<b>3 3 C</b>	<b>2 2 1</b>	(100)-(010)	6	2193.03905	-628( 1s7)	0.4196( <b>28</b> )	0.4330	0.s173	0.507s	
4 3 1	3 2 2	(010)-(000)	6	1799.61564	147( 211)	0.4131(122)	0.4030	<b>0.3811</b>	0.4462	
5 3 2	4 2 3	(020)-(010)	6	1814.71471	<b>1885( 110)</b>	0.4123(129)	0.4180	0.4437	0.4954	
<b>5 3 2</b>	<b>4 2 3</b>	(010)-(000)	<b>8</b>	1821.83447	341s( 1s1)	0.4086( 65)	0.4180	0.4437	0.4954	
5 3 2	<b>4 2 3</b>	(010)-(000)	7	1825.73991	2924( 444)	0.3936( 2s7)	0.4180	0.4437	0.4954	
S 3 2	<b>4 2 3</b>	(010)-(000)	6	1630.13204	1922( 297)	0.4037(330)	0.4180	0.4437	0.4954	
6 3 3	<b>5 2 4</b>	(020)-(010)	6	1849.64108	3691( 236)	0.4047( 80)	0.4230	0.4670	0.5168	
6 3 3	<b>5 2 4</b>	(010)-(000)	7	1862.19597	-1308( 267)	0.4007(131)	0.4'430	0.4678	0.5168	
6 3 3	<b>5 2 4</b>	(010)-(000)	6	1866.30090	171s( 103)	0.3988( 15)	0.4230	0.4678	0.s168	
7 3 4	<b>6 2 5</b>	(0201)-(010)	6	1891.55090	-157( 1s7)	0.3861( 4S)	0.4130	0.4879	0.s112	
7 3 4	6 2 5	(010)-(000)	8	1902.60676	-486( 946)	0.4147(145)	0.4130	<b>0.4879</b>	0.5172	
7 3 4	6 2 5	(010)-(000)	7	1906.06672	-1256( <b>780</b> )	0.4098( 40)	0.4130	0.4879	0.5172	
7 3 4	6 2 5	(010)-(000)	6	1909.96397	-1820( <b>86</b> )	0.413S( 25)	0.4130	0.4079	0.5172	
<b>8 3 5</b>	7 2 6	(010)-(000)	8	1954.40621	-2746( 79)	<b>0.3826( 8)</b>	0.3810	0.3967	0.4s09	
8 3 5	7 2 6	(010)-(000)	6	1961.16148	-1167( 115)	0.4250(194)	0.3810	0.3967	0.4509	
9 3 6	0 2 7	(010)-(000)	6	2012.791S1	-2963( s97)	0.3477( 86)	0.3520	<b>0.4170</b>	0.4311	
9 3 6	8 2 7	(010)-(000)	6	2019. 07025	-1757( 269)	0.4082(140)	0.3520	0.4170	0.4311	
1 0 3 7	9 2 8	(010)-(000)	6	2081 .873S2	<b>3250( 370)</b>	0.3782( <b>51</b> )	0.3700	0.4107	0.4182	
<b>11 3 8</b>	1 0 2 9	(010)-(000)	6	2147.40557	-1224( 629)	0.3411( {259})	0.3410	0.3672	0.37s1	
1 2 3 9	11 2 10	(010)-(000)	6	2213.40730	-2042( 1s7)	0.3101( 41)	0.3040	0.3201	0.3273	
14 3 1 1 1 3 2 1 2	(000)-(000)	6	697.05437	-2407( 392)	0.2233(143)	0.2400	<b>0.1836</b>			
1 . 5 3 1 2 1 4 2 1 3	(000)-(000)	6	7S2 .26473	<b>-2748( 283)</b>	0.2300( 64)	0.2280				
1 6 3 1 3 1 S	2 1 4	(000)-(000)	6	80 S.99372	<b>-942( 385)</b>	0.1760( <b>89</b> )	0.1830			
17 3 14	16 2 15	(000)-(000)	6	858.54302	-146S( 267)	0.1s59( 41)	0.1s20			
<b>4 4 1</b>	3 3 0	(010)-(000)	<b>8</b>	1834.70140	<b>2247( 26)</b>	0.3730( <b>82</b> )	0.3710	0.3993	0.6098	
<b>4 4 1</b>	3 3 0	(020)-(010)	6	1839.1469s	2125( 187)	0.3303( 64)	0.3710	0.3993	0.4090	
4 4 1	3 3 0	(010)-(000)	7	1839.16461	2220(1494)	0.3390(109)	0.3710	0.3993	0.4098	
4 4 1	3 3 0	(010)-(000)	6	1044.18066	19s0( 2s0)	0.3374(263)	0.3710	0.3993	0.4098	
<b>4 4 1</b>	3 3 0	(100) - [010]	6	2227.40189	-1 S7(1236)	0.3372( 44)	0.3710	0.3993	0.4098	
<b>5 4 2</b>	<b>4 3 1</b>	(010)-(000)	8	1858.27243	1327( 7s6)	0.3692(160)	0.3820	0.3870	0.4079	
<b>5 4 2</b>	<b>4 3 1</b>	(010)-(000)	7	1862.78366	<b>-628( 1s7)</b>	0.3S06( 63)	0.3820	0.3870	0.4079	
<b>5 4 2</b>	<b>4 3 1</b>	(020)-(010)	6	1062.95596	1572( 322)	0.3399(103)	0.3820	0.3570	0.4079	
<b>5 4 2</b>	4 3 1	(010)-(000)	6	1067.85284	178s( 290)	0.3602(238)	0.3820	0.3570	0.4079	
<b>5 4 2</b>	<b>4 3 1</b>	(300)-(010)	6	2251.86978	79( 1335)	0.3603(138)	0.3820	0.3570	0.4079	
6 4 3	5 3 a	(010)-(000)	8	1879.78473	2368( <b>383</b> )	0.3934( 92)	0.3980	0.3916	0.44ss	
6 4 3	5 3 2	(010)-(000)	7	1004.39300	1s70( 1s7)	0.343S( 54)	0.3950	0.3916	0.4455	
6 4 3	6 3 2	(020)-(010)	6	108s.02081	2571( 3s8)	0.3 S67( 168)	0.3950	0.3916	0.4455	
6 4 3	<b>5 3 2</b>	(010)-(000)	6	1889. S6946	2640( 110)	0.3919(308)	0.3950	0.3916	0.4455	
7 4 4	6 3 3	(010)-(000)	<b>8</b>	1897.85207	<b>2512( 898)</b>	0.3956( 41)	0.4100	0.41s4	0.4543	
7 4 4	6 3 3	(020)-(010)	6	1903.97997	78S( 924)	0.3666( 99)	0.4100	0.41s4	0.4543	
7 4 4	6 3 3	(010)-(000)	6	1907.95912	34s1( 90)	0.41s9( 68)	0.4100	0.41s4	0.4543	
0 4 s	7 3 4	(010)-(000)	<b>8</b>	1911.86900	864( 707)	0.3882( 2)	0.4020	0.424s	0.465s	
8 4 s	7 3 4	(010)-(000)	<b>7</b>	1916.80110	550( 707)	0.4108( 2)	0.4020	0.424s	0.465s	
8 4 s	7 3 4	(020)-(010)	6	1918.86010	4292( 196)	0.3711(167)	0.4020	0.4245	0.465s	
8 4 s	7 3 4	(010)-(000)	6	1922.34080	2178( 146)	0.4188( 64)	0.4020	0.424s	0.46ss	
9 4 6	8 3 s	(010)-(000)	6	1933.16544	1756( 505)	0.3887( 94)	0.3920	0.4300	<b>0.4515</b>	
1 0 4 7	9 3 6	(030)-(000)	<b>8</b>	1930.70164	-1099( 314)	0.3547( 5)	0.3800	0.4320	0.4447	
1 0 4 7	9 3 6	(010)-(000)	6	1941.62750	1697( 92)	0.3936( 67)	0.3800	0.4320	0.4447	
1 1 4 8	1 0 3 7	(010)-(000)	6	1949.24966	1562( 1s6)	0.3666( 89)	0.3600	0.4280	0.4229	
12 4 9	9 1 1 3 8	(010)-(000)	6	1957 .655s4	1937( 132)	0.3367( <b>57</b> )	0.3300	0.3692	0.3786	
1 3 4 1 0	1 0 1 2 3 9	(010)-(000)	6	1968.1707s	942( 587)	0.3084( 68)	0.3000	0.3204	0.3304	
1 4 4 1 1	1 3 3 1 0	(010)-(000)	6	1981.32804	<b>1443( 187)</b>	0.2444(103)	0.2500	0.2490	0.2589	
4 4 0	3 3 1	(010)-(000)	8	1834 .93s13	<b>1815( 613)</b>	0.3516( 120)	0.3500	0.3966	0.4160	
4 4 0	3 3 1	(020)-(010)	6	1839.32460	1034( 265)	0.3187(111)	0.3500	0.3966	0.4160	
4 4 0	3 3 1	(010)-(000)	7	1839.39107	1570( 314)	0.3517( 75)	0.3500	0.3966	0.4160	
4 4 0	3 3 1	(010)-(000)	6	1844.39933	2269( 110)	0.3638(304)	0.3500	0.3966	<b>0.4160</b>	
<b>5 4 1</b>	<b>4 3 2</b>	(010)-(000)	<b>8</b>	10 89.06543	168s( 134)	0.3621( <b>88</b> )	0.3s10	0.3780	0.4109	
5 4 1	4 3 2	(020)-(010)	6	1864.17126	400( 207)	0.3326( 68)	0.3510	0.3780	0.4109	
5 4 1	4 3 2	(010)-(000)	7	1864.32859	1062(1015)	0.3496( <b>86</b> )	0.3510	0.3780	0.4109	
<b>5 4 1</b>	4 3 2	(010)-(000)	6	1869.34567	109S( 114)	0.3440( 269)	0.3510	<b>0.3780</b>	0.4109	
<b>6 4 2</b>	5 3 3	(010)-(000)	8	1885.76960	<b>2815( 657)</b>	0.3579(145)	0.3600	0.38s9	0.4249	
6 4 2	5 3 3	(010)-(0001)	7	1890.20712	<b>890( 773)</b>	0.363S5( 64)	0.3600	0.3859	0.4249	
6 4 2	5 3 3	(0101)-(000)	6	1095.19741	2210( <b>109</b> )	0.3649( 25)	0.2600	0.3859	0.4249	
7 4 3	6 3 4	(010)-(000)	8	1913.93136	2396( 647)	0.3758(240)	0.3670	0.4234	0.4414	
7 4 3	6 3 4	(010)-(000)	6	1923.16051	2063( 120)	0.3675( 47)	0.3670	0.4234	0.4414	
8 4 4	7 3 5	(010) - [001]	6	19s4.99591	3492( 155)	0.3787( 63)	0.3750	0.3792	0.4256	
<b>9 4 5</b>	<b>8 3 6</b>	[020]-(010)	6	1981.60212	2120( 79)	0.3269( 15)	0.3800	0.3999	0.4172	
9 4 5	8 3 6	(010)-(000)	8	1984.55327	<b>1178( 236)</b>	0.3427( 5)	0.3800	0.3999	0.4172	
9 4 8	8 3 6	(010)-(000)	6	1992.65043	2690( 125)	0.3936( 71)	0.3800	0.3999	0.4172	
1 0 4 6	9 3 7	(010)-(000)								

table 2 continued

upper z .7 KA KC	lower J KA KC	band	mol.	frequency (computed)	shift (obs.)	width (ohm.)	smoothed	XITRAN	BK
6 5 2	5 4 1	{(10)-(000)}	8	1932.11673	-230[ 437)	0.3224( 97)	0.3150	0.3262	0.3510
6 5 2	5 4 1	{(10)-(000)}	6	3942. S1608	-437( 79)	0.3137(217)	0.3150	0.3262	0.3518
6 5 2	5 4 1	{(020)-(010)}	6	1945.47629	1083( 684)	0.2722(172)	0.3150	0.3262	0.3518
7 5 3	6 4 2	{(10)-(000)}	8	1955.73421	1335( 79)	0.3283( 79)	0.3220	0.3724	0.3890
7 5 3	6 4 2	{(010)-(000)}	6	1966.26131	1171( 115)	0.3613( 97)	0.3220	0.3724	0.3890
7 5 3	6 4 2	{(020)-(010)}	6	1969.38050	1256( 628)	0.2842( 44)	0.3220	0.3724	0.3890
6 5 4	7 4 3	{(10)-(000)}	8	1977. <b>.62983</b>	2041( 628)	0.3384( <b>68</b> )	0.3380	0.3790	0.4027
0 5 4	7 4 3	{(010)-(0001)}	7	1982.70050	157(1256)	0.3369( 22)	0.3380	0.3790	0.4027
6 5 4	7 4 3	{(010)-(0001)}	6	1980.3985	2761( 96)	0.3787(146)	0.3380	0.3790	0.4027
9 5 5	0 4 4	{(010)-(000)}	6	2007.70030	2504( 218)	0.3686( 82)	0.3520	0.3962	0.4101
10 5 6	9 4 5	{(010)-(000)}	6	2023.03015	3111( 453)	0.3698(114)	0.3700	0.4053	0.4187
11 5 7	1 0 4 6	{(010)-(000)}	6	2034.05607	2950( 302)	0.3674( 138)	0.3900	0.4043	0.4208
13 5 9	12 4 8	{(010)-(000)}	6	2046.79549	-1413( 801)	0.3670( 27)	0.3600	0.4101	
14 5 10	1 3 4 9	{(010)-(000)}	6	2051.55592	1963( <b>79</b> )	0.3221( 57)	0.3100	0.3504	
5 5 0	4 4 1	{(010)-(000)}	8	1907.71251	-335( 193)	0.3020( 93)	0.3030	0.2975	0.3166
5 5 0	4 4 1	{(010)-(000)}	7	1912.57212	-507( 290)	0.2762( 73)	0.3030	0.2975	0.3166
5 5 C	4 4 1	{(010)-(000)}	6	1910.03540	-2281( 538)	0.2553( 60)	0.3030	0.2975	0.3166
5 5 C	4 4 1	{(020)-(0101)}	6	1920.91362	-2286(1722)	0.2516( 64)	0.3030	0.2975	0.3166
6 5 1	5 4 2	{(010)-(000)}	8	1932.39067	-2277( 707)	0.2901( 88)	0.3100	0.3081	0.3424
6 5 1	S 4 2	{(010)-(000)}	7	1937.2'7459	-3141( 629)	0.3107( 44)	0.3100	0.3081	0.3424
6 5 1	5 4 2	{(010)-(000)}	6	1942.76537	-792( 103)	0.3091( 35)	0.3100	0.3081	0.3424
6 5 1	5 4 2	{(020)-(010)}	6	1945.66568	-209( 632)	0.2652( 97)	0.3100	0.3081	0.3424
1 5 2	6 4 3	{(0101)-(000)}	8	1957.02922	-1355( 793)	0.3149(201)	0.3100	0.3397	0.3623
7 5 2	6 4 3	{(010)-(0001)}	7	1961.93078	-1308( 370)	0.3137( 43)	0.3100	0.3397	0.3623
7 5 2	6 4 3	{(010)-(000)}	6	1967.44235	-219( 162)	0.3220( 43)	0.3100	0.3397	0.3623
7 5 2	6 4 3	{(020)-(010)}	6	3.970.25549	314( 5591)	0.2851( 79)	0.3100	0.3397	0.3623
8 5 3	7 4 4	{(010)-(000)}	8	1981 .990S3	-2827( 672)	0.2984( 37)	0.3120	0.3266	<b>0.3588</b>
8 5 3	7 4 4	{(010)-(000)}	6	1992.38617	-1667( 112)	0.3278(109)	0.3120	0.3266	<b>0.3588</b>
9 5 4	0 4 5	{(010)-(0001)}	8	2008.08026	-2434( <b>550</b> )	0.2963( 33)	0.3150	0.3359	0.3546
9 5 4	0 4 5	{(010)-(0001)}	6	2018.33751	-201( 161)	0.3240( 92)	0.3150	0.3359	0.3546
10 5 5	9 4 6	{(010)-(000)}	6	2046.51583	-716( 69)	0.3326( 91)	0.3270	0.3842	0.3872
11 5 6	1 0 4 7	{(010)-(000)}	6	2078.56804	2799( 172)	0.3351( 51)	0.3380	0.4113	<b>0.4116</b>
12 5 7	1 1 4 8	{(010)-(0001)}	6	2116.22385	1963( 79)	0.3147( 37)	0.3180	0.4011	0.4091
13 5 8	12 4 9	{(010)-(000)}	6	2160.69613	2460( 593)	0.3244( 47)	0.3220	0.3967	0.4009
1 5 5 1 0	1 4 4 3 1	{(000)-(0001)}	6	614.57692	-79( 79)	0.3392(135)	0.3400	0.2878	
6 6 1	5 5 0	{(010)-(0001)}	8	1980.76126	-5700(3000)	0.2195 [106]	0.2130	0.2086	
6 6 1	5 5 0	{(010)-(0001)}	7	1985.99817	-2120(1806)	0.2086(173)	0.2130	0.2086	
6 6 1	5 5 0	{(020)-(0101)}	6	2000.90318	-890( 854)	0.2107( 67)	0.2130	0.2086	
7 6 2	6 S 1	{(010)-(0001)}	7	2005.6025S	79( 236)	0.2380( 11)	0.2520	0.2567	
7 6 2	6 S 1	{(010)-(0001)}	6	2016.79804	-593( 140)	0.2546( <b>38</b> )	0.2520	0.2567	
8 6 3	7 5 2	{(010)-(000)}	6	2061.28832	475( <b>168</b> )	0.2848( 651)	0.2830	0.2834	
9 6 4	8 5 3	{(010)-(000)}	6	2065.01825	1044( 46)	0.3036( 45)	0.3020	0.3259	
1 0 6 5	9 5 4	{(010)-(000)}	6	2087.40773	919( 65)	0.3092( 63)	0.3100	0.3267	
1 1 6 6	1 0 5 5	{(010)-(000)}	6	2107.54642	295( 279)	0.3161 [196]	0.3200	<b>0.3487</b>	
1 2 6 7	1 1 5 6	{(010)-(000)}	6	2124.29003	379(1213)	0.3 S00(123)	0.3270	0.3846	
1 3 6 8	1 2 7 S 7	{(010)-(000)}	6	2136.71483	-2041( 785)	0.3175( 233)	0.3370	0.3701	0.3459
6 6 0	5 5 1	{(020)-(0101)}	4	2001.01686	<b>-2984( 7S6)</b>	0.1947( 28)	0.2020	0.2087	0.2269
7 6 1	6 5 2	{(010)-(000)}	8	2005.64427	<b>-707( 236)</b>	0.2393( <b>86</b> )	0.2370	<b>0.2551</b>	0.2682
7 6 1	6 5 2	{(010)-(000)}	7	2010.91187	236( 79)	0.2404(142)	0.2370	0.2551	0.2682
7 6 1	6 5 2	{(020)-(0101)}	6	2016.83477	-329( 92)	0.2565( 71)	0.2370	0.2ss1	0.2682
7 6 1	6 5 2	{(020)-(0101)}	6	2026.12071	-3769( 471)	0.2356( 30)	0.2370	0.2551	0.2682
8 6 2	7 5 3	{(010)-(000)}	8	<b>2030.23177</b>	<b>1806(1178)</b>	0.2454( <b>23</b> )	0.2600	0.2806	0.2959
8 6 2	7 5 3	{(010)-(000)}	6	2041.49559	-201( 218)	0.2645( 86)	0.2600	<b>0.2806</b>	0.2959
9 6 3	8 5 4	{(010)-(000)}	8	2054.51439	-393(2276)	0.2396( 11)	<b>0.2880</b>	0.3233	0.3134
9 6 3	8 5 4	{(010)-(000)}	6	2065.84661	<b>380( 105)</b>	0.2922(103)	0.2880	0.3233	0.3134
1 0 6 4	9 5 5	{(010)-(000)}	6	2090.02280	101( 548)	0.3048(114)	0.3020	0.3289	0.3204
1 1 6 5	S 1 0 5 6	{(010)-(000)}	6	2114.42564	-204( 424)	0.3053( <b>83</b> )	0.3020	0.3249	0.3278
1 2 6 6	1 1 5 7	{(010)-(0001)}	6	2139.81421	-2512( 314)	0.2881( 44)	0.2950	0.2991	0.3157
1 3 6 7	12 5 8	{(010)-(0001)}	6	2167.34029	<b>-2041( 157)</b>	0.2766( 45)	0.2700	0.3326	0.3293
1 6 6 10	1 5 5 1 1	{(000)-(0001)}	6	600.66202	-1885(4396)	0.2067( 94)	0.2880		
8 7 2	7 6 1	{(010)-(000)}	8	2078.16700	-1806(1335)	0.2039(103)	0.2180	0.1922	0.2064
8 7 2	7 6 1	{(010)-(000)}	6	2090.10071	-157( 963)	0.2254( 77)	0.2180	0.1922	0.2064
9 7 3	8 6 2	{(010)-(000)}	6	2114.98302	-1884( 407)	0.2439( 37)	0.2400	0.2343	0.0232
1 0 7 4	9 6 3	{(010)-(000)}	6	2139.32839	-1910( 90)	0.2638( <b>38</b> )	0.2600	0.2700	0.2631
1 1 7 5	1 0 6 4	{(010)-(000)}	6	2162.88970	-619( 854)	0.2599(189)	0.2780	0.2613	0.2735
1 2 7 6	1 1 6 5	{(010)-(000)}	6	2185.27821	-2277( 393)	0.2863( 37)	0.2930	0.3000	0.2987
7 7 0	6 6 1	{(010)-(000)}	6	2064.85315	-3000( 900)	0.1845( 70)	0.1900	0.1509	0.1631
9 7 2	8 6 3	{(010)-(000)}	6	2115.01605	-1687( 198)	0.2332( 64)	0.2360	0.2312	0.2322
1 0 7 3	9 6 4	{(010)-(000)}	6	2139.47899	-1608( 701)	0.2551( 75)	0.2540	0.2625	0.2500
1 1 7 4	1 0 6 5	{(010)-(000)}	6	2163.43046	-1797( 317)	0.2734(103)	0.2700	0.2661	0.2712
1 2 7 5	1 1 6 6	{(010)-(000)}	6	2186.89818	-3141( 786)	0.2913( 61)	0.2900	0.2862	0.2816
8 8 1	7 7 0	{(010)-(000)}	6	2136.14333	-2359( 179)	0.1462( 40)	0.1490	0.1147	0.1290
1 0 8 3	9 7 2	{(010)-(000)}	6	2186.92036	-622( 757)	0.1877(102)	0.1880	0.1952	0.2000
1 1 8 4	1 0 7 3	{(010)-(000)}	6	2211.60569	-1884( 339)	0.2188( 77)	0.2070	0.2356	0.0231
1 2 8 5	1 1 7 4	{(010)-(000)}	6	2235.64059	-1884( 471)	0.2254( 41)	0.2170	<b>0.2332</b>	0.2419
9 8 3 .	8 7 2	{(010)-(000)}	6	2161.72537	-1727( 900)	0.1774( 17)	0.1680	0.1692	0.1726
1 1 8 3	1 0 7 4	{(010)-(000)}	6	2211.63114	-1390( 840)	0.2035(165)	0.2020	0.2346	0.2305
1 0 9 2	9 8 1	{(010)-(000)}	6	2231.13709	-1510( 220)	0.1481( 32)	0.1500	<b>0.1472</b>	0.1506
9 9 0	8 8 1	{(010)-(000)}	6	2205.21745	-13951( <b>379</b> )	0.1329( 37)	0.1380	0.1028	0.1080
1 1 9 2	1 0 8 3	{(010)-(000)}	6	2256.61774	-1600( 500)	0.1620(140)	0.1600	0.1676	0.1730
10 10	1 0 9 0	{(010)-(000)}	6	2271.72342	-2748( 393)	0.1092( 25)	0.1130	0.0925	0.0948
3 3 1	2 0 0 2	{(010)-(0001)}	6	1837.36063	3055( 544)	0.4132( 20)	0.4180	0.4369	0.4651
4 3 2	3 0 0 3	{(020)-(010)}	6	1865.96939	2905( 393)	0.4447(1941)	0.4490	<b>0.4916</b>	0.5193
4 3 2	3 0 0 3	{(010)-(0001)}	6	1868.05410	256( 142)	0.4831(131)	0.4490	0.4916	0.5193
5 3 3	4 0 4	{(010)-(000)}	8	1894.90457	2591( 707)	0.4118( 22)	0.4200	0.4311	0.4806
5 3 3	4 0 4	{(010)-(000)}	6	1904.35500	4484( 484)	0.4652(132)	<b>0.420C</b>	0.4311	0.4806
6 3 4	5 0 5	{(010)-(000)}	8	1937.17078	1570(1095)	0.3586(100)	0.3900	0.4369	0.4725
6 3 4	5 0 5	{(020)-(010)}	6	1944.19961	-236( 393)	0.4101( 2)	0.3900	0.4369	0.4725
6 3 4	5 0 5	{(010)-(000)}	6	1946.36442	1509( 187)	0.4001( 85)	0.3900	0.4369	0.4725
7 3 5	6 0 6	{(010)-(000)}	6	1993.25794	1871( 460)	0.3624(100)	0.3600	0.3930	0.4299
8 3 6	1 0 7	{(010)-(000)}	6	2043.94910	2550( 110)	0.3420( 80)	0.3300	0.3472	

table 2. cont inued

upper z J KA KC	lower J KA KC	band	mol.	frequency (computed)	shift (obs.)	width (obs.)	mc. ócna	WITKAN	BR
4 4 1	3 : 2	(C10)-(000)	6	19.86.23347	6s18( 133)	0.4280[ 32)	0.4320	0.44ss	0.4643
5 4 2	4 : 3	(010)-(000)	6	1976.19835	4388( 179)	0.4317( 79)	0.4250	0.4294	0.47S6
6 4 3	5 : 4	[010)-(000)	8	1987.15305	-393( 236)	0.37s8( 30)	0.4120	0.4177	0.4714
6 4 3	5 : 4	(010)-(000)	6	1998.92406	<b>2069( 284)</b>	0.4132(100)	0.4120	0.4177	0.4714
7 4 4	6 : 5	(010)-(000)	6	2026.60227	1681( 131)	0.3989( 73)	0.3900	0.4244	0.484s
8 4 5	7 : 6	(010)-(000)	6	2060.48344	1735( 163)	0.3714(123)	0.3700	0.3742	0.4023
9 4 6	8 : 7	(010)-[000]	6	2100.43277	1487( 40)	0.3363( 97)	0.3s00	0.3S36	0.3940
10 4 7	9 : 8	(010)-(000)	6	2145.46704	3479( 146)	0.3103(109)	0.3200	0.3334	0.3426
: : 4 8 1	0 : 9	(010)-(000)	6	2194.38114	2983( 187)	0.2641( 27)	0.2900	0.2975	0.3050
12 4 9	11 : 10	(010)-(000)	6	2246.03100	2355( 667)	0.2359(122)	0.2700	0.2889	0.2672
13 4 10	12 : 11	(000)-(000)	6	651.58016	<b>1884( 157)</b>	0.2761( 78)	<b>0.2500</b>	0.2203	<b>0.2282</b>
14 4 11	13 : 12	(000)-[000]	6	<b>703.71288</b>	314(1065)	0.2067( 71)	0.2120	0.1812	0.193s
15 4 12	14 : 13	(000)-(000)	6	755.98148	-262( 74)	0.1978( 2s)	0.2000		
16 4 13	15 : 14	(000)-(000)	6	808.03800	-1204( 196)	0.1824(109)	0.1800		
5 4 1	4 : 4	(010)-(000)	6	2027.02419	4168( 288)	0.4376(111)	0.4210	0.4389	0.4638
6 4 2	5 : 5	(010)-(000)	6	2072. S4007	-534(1058)	0.3701 [167)	0.4120	0.4291	0.4390
7 4 3	6 : 6	(010)-(000)	6	2124.88689	6232( 299)	0.3847( 1s)	0.4020	0.4228	0.4433
0 4 4	7 : 7	(010)-(000)	6	2185.21108	1256( 587)	0.3899( 99)	0.3s40	0.3841	0.432S
11 4 7	10 : 10	[000)-(000)	6	784.45832	<b>-2826( 222)</b>	0.3965(229)	0.3880	0.4069	
13 4 9	12 : 12	(000)-(000)	6	975.94556	-4973( 74)	0.3317(122)	0.3350	0.3399	
5 5 1	4 : 2	(010)-(000)	6	2090.36148	5287( S92)	0.3656( 82)	0.3680	0.3627	0.3982
6 5 2	5 : 3	(010)-(000)	6	2106.34669	6002( 148)	0.3771(204)	0.3820	0.3s97	0.4131
7 5 3	6 : 4	(010)-(000)	6	2121.26808	34ss( 472)	0.3974( <b>83</b> )	0.3920	0.4372	0.4626
8 5 4	7 : 5	(010)-(000)	6	2137.22318	3379( sol)	0.3950(146)	0.3900	0.4127	0.4472
9 5 5	8 : 6	(010)-(0001)	6	2156.56417	2S84( 31s)	0.3681( SS)	0.3710	0.4278	0.4280
10 5 6	9 : 7	(010)-(000)	6	2181.34399	298S( 676)	0.3446(187)	0.3480	0.3879	0.3926
11 5 7	10 : 8	(010)-(000)	6	2212.54050	0( 888)	0.3172( 80)	0.3110	0.3378	0.3s03
12 5 8	1 1 2 9	[010)-(000)	6	224. S85511	1806( 79)	0.2 s92(108)	0.2900	0.3080	0.3043
13 5 9	12 : 2 10	(000)-(000)	6	626.32260	837(1120)	0.2460(235)	0.2670	0.2229	0.2521
15 5 11	14 2 12	(000)-(000)	6	718.65713	3101( 233)	0.2237( 75)	0.2230		
1 6 5 1 2 1 5 2 1 3	{0001)-(000)	6	767.26370	10S( 148)	0.20s2( 33)	0.2030			
5 5 0	4 : 2 3	(010)-(000)	6	2105.7 S089	34ss( 157)	0.3683( 71)	0.3620	0.4399	0.4164
6 5 1	5 2 4	(010)-(000)	6	2136.67110	2355( 314)	0.3491( 27)	0.3s00	0.4291	0.4218
0 s 3	7 2 6	(010)-[000]	6	2210.52393	2434(1021)	0.3317( 54)	0.3350	0.3841	0.3747
9 5 4	8 2 7	(010)-(000)	6	2255.44504	1178( 393)	0.2883( 1)	0.3100	0.3283	0.3571
11 5 6	1 0 2 9	(000)-(000)	8	702.58955	-6046( 550)	0.3741(100)	0.3630	<b>0.2818</b>	0.3719
12 5 7	11 2 10	(000)-(000)	6	77. S. S4906	-1622( 323)	0.3561( 183)	0.3720		0.3737
13 5 8	12 2 11	1000)-(000)	6	854.58335	-1099( 462)	0.3621( 40)	0.3600		0.3647
16 5 9	1 3 2 1 2	(000)-(000)	6	941.02235	-1021( 864)	0.3343( 231)	0.3270		
8 6 3	7 3 4	(010)-(000)	6	22 S. 76121	3219(1806)	0.3731( 74)	0.3850	0.3889	0.4239
1 0 6 S	9 3 6	(010)-(000)	6	2201.78590	-1884( 314)	0.3379( 77)	0.3s80	0.3947	0.4077
1 6 6 1 1 5 3 1 2	{000)-(000)	6	742.06718	S6S3( 462)	0.22s3( <b>82</b> )	0.2300			
9 6 3	8 3 6	(000)-(000)	8	617.35008	-2198( 440)	0.3176( 180)	0.3170	0.3283	0.34s8
12 6 6	1 1 3 9	(000)-(000)	6	742.63330	471( <b>248</b> )	0.319 S(211)	0.3020		
1 3 6 7	1 2 3 1 0	(000)-(000)	6	793.90835	1832( 74)	0.2821(240)	0.3000		0.3018
1 4 6 8	1 3 3 1 1	(000)-(000)	6	853.37652	<b>-1884( 128)</b>	0.3073( 63)	0.2980		
1 S 6 9 1 4 3 1 2	{000)-(000)	6	921.39782	-12S6( 314)	0.3071( 2s)	0.2950			
<b>8 7 2</b>	7 4 3	(000)-(000)	8	648.97843	-2s13(2042)	0.4011(199)	0.34s0	0.3170	0.3389
9 7 3	8 4 4	(000)-(000)	6	678.80778	1413( 314)	0.3017(142)	0.3180	0.3304	0.3483
1 > 7 6 1 1 4 7	{000)-(000)	6	713.7S160	3298( 315)	0.34s0(298)	0.3570			0.3987
1 3 7 7	1 2 6 8	[000)-(000)	6	721.42248	-1609( <b>463</b> )	0.3779( 61)	0.3600		
14 7 8	1 3 4 9	{000)-(000)	6	730.54429	1021( <b>324</b> )	0.3340( 41)	0.3420		
1 5 7 9	1 4 4 1 0	(0001)-(000)	6	743.34725	-1178( 791)	0.3118{ 67)	0.3170		
14 7 10	15 4 11	(000)-(000)	6	761. <b>47255</b>	1884( 471)	0.2701( S)	0.2730		
8 7 1	7 4 4	(000)-(000)	6	662.94683	419( 288s)	0.2913(207)	0.2900	0.3841	0.2982
1 0 7 3	9 4 6	(000)-(000)	6	713.48386	-942( <b>188</b> )	0.3333(111)	0.3120		0.3314
11 7 4	1 0 4 7	{000)-[000]	6	740. S6973	-550( 79)	0.2 S03 (129)	0.2900		0.326s
12 7 5	3 1 4 10	(000)-(000)	6	770.07502	<b>-1688( 321)</b>	<b>0.2887( 160)</b>	0.2720		0.3063
1 3 7 6	1 2 4 9	(000)-(000)	6	802.98998	-2041( 314)	0.2709( JO)	0.2610		0.272s
1 4 7 7	1 3 4 3 . 0	{000)-{000}	6	040.31792	1286( <b>222</b> )	0.2526[ 43)	0.2570		
15 7 8	14 4 11	(000)-(000)	6	003.07312	-2S12( 157)	0.2698( 89)	0.2650		
<b>8 8 1</b>	7 5 2	(000)-(000)	6	729.20742	-1923( 641)	0.2674(173)	0.2700		
9 0 2 2	8 S 3	(000)-(000)	6	783.89344	-105( 196)	0.2896 {114)	0.2820		
1 0 0 3	9 5 4	(000)-(000)	6	776.90653	-2002( 391)	0.294 S(177)	0.3010		
1 1 8 4	1 0 5 5	(000)-(000)	6	797.55584	39( 204)	0.3343 [167)	0.3220		
1 2 8 8	s 1 5 6	(000)-(000)	6	814.51699	-1S18( 323)	0.3602( 80)	0.3s10		
1 3 8 6	1 2 5 7	{000)-(000)	6	827.11801	-3036( 267)	0.3599( 30)	0.3s80		0.3717
16 8 7	s 1 3 5 8	(000)-(000)	6	835.55300	-1099( 220)	0.3670( 4)	0.3620		0.3766
<b>8 8 0</b>	7 s 3	{000)-(000)	6	72 S. 39622	<b>-2120( 423)</b>	0.2708( 71)	0.2590		
9 8 1	8 5 4	{000)-[000]	6	754.63837	-1099( 333)	0.2703( 32)	0.2670	0.2750	
1 0 8 2	9 s 5	{000)-(000)	6	779.30362	-157( 3S1)	0.2980( <b>50</b> )	<b>0.2880</b>		
1 1 8 3	s 1 0 S 6	{000)-(000)	6	003. S4642	-2198( 628)	0.2867(268)	0.2940		0.3060
12 8 4	1 1 5 7	{000)-(000)	6	027.74300	-2198( 33S)	0.2947( S1)	0.2980		0.2s8s
13 8 8	s 1 2 5 8	{000)-(000)	6	052.48904	-1806( 176)	0.2S67( 89)	0.2940		0.2944
9 9 1	8 6 2	{000)-(000)	6	813.02731	-2774( 412)	0.2262( 9s1)	0.2220		
1 0 8 2	S 6 3	{000)-(000)	6	839.87206	-3193( 267)	0.2434( <b>66</b> )	0.2400		0.2328
11 9 3	1 0 6 4	{000)-(000)	6	864.9S091	-785( 128)	0.2 S97 (112)	0.2s80		0.2480
12 9 4	1 1 6 5	{000)-(000)	6	888.643S3	-1413( 128)	0.2868( 57)	0.2770		0.2695
9 s 0	8 6 3	{000)-(000)	6	813.8577s	-2512( S59)	0.24SS( S1)	0.2480		
1 0 9 1	9 6 4	{000)-(000)	6	840.00962	-3298( 660)	0.2460(123)	0.2510		0.2310
11 S 2	1 0 6 5	{0001)-(0001)	6	86. S44771	12S6 (111)	0.261 S(1S1)	0.2s80		0.2414
1 2 9 3	1 1 6 6	{000)-(000)	6	890.09267	-1099( 314)	0.2650( 47)	0.2620		0.2s66
13 S 4	1 2 6 7	{0001)-(000)	6	913.98292	-2591( 236)	0.2604( 16)	0.2600		0.2570
10 10 1	9 7 2	{000)-(000)	6	891.30066	-1806 (1S63)	0.2087(166)	0.2070		0.1645
1 2 1 0 3	1 1 7 4	{000)-(000)	6	944.05874	-628( 126)	0.2068( 11)	0.2070		0.2100
11 10 1	1 0 7 4	{000)-(000)	6	918.4 <b>8208</b>	<b>-864( 707)</b>	0.2102( <b>53</b> )	0.20s0		
9 5 s	8 0 8	{000)-(000)	6	730.91721	-550( 6131)	0.3021(268)	0.3050	0.3283	<b>0.3386</b>
11 S 7 1 0 0 1 L 7	{000)-{000}	6	871.25274	864( 79)	0.3082( 61)	0.3000		0.3025	
1 2 S 8 1 1 0 1 1	{000)-(000)	6	848.26292	-471( <b>587</b> )	0.3077( 40)	0.3000		0.2907	
13 5 9	1 2 0 1 2	{000)-(000)	6	1028.6 B549	<b>-785( 157)</b>	0.2827( 73)	0.2900		
<b>14 5 10</b>	13 0 <b>13</b>	{000)-(000)	6	1111. S7493	4162( 864)	0.2205( 5)	0.2s00		0.2192
1 1 6 6	1 0 1 9	{0001)-(000)	6	049.57954	2460 (36S)	0.2SS3 (S0)	0.2900		0.2912
12 6 7 1	1 1 1 0	{0001)-(000)	6	908.952S1	3377( 79)	0.2801( 27)	0.2820		0.2780
13 6 0	1 2 1 1 1	{000)-(000)	6	973.48321	3298( 129)	0.2636( 74)	0.2610		0.178S
14 6 9 1	3 1 2	{000)-(000)	6	1042.52516	1178( 79)	0.2448( 47)	0.2380		0.2105
6 6 0	5 1 5	{000)-(							

table 2. continued

upper J KA KC	lower .7 KA KC	band	mol.	frequency (computed)	shift (cm.)	width (ohm.)	smoothed	HITRAN	BK
1 0 6 4	9 1 9	(000)-(000)	6	955.25182	994( 4s0)	0.2986(114)	0.2900		
11 6 5	10 1 10	(000)-(000)	6	1029.49648	1153( S34)	0.3018( 99)	0.3000		
7 7 1	6 2 4	(000)-(000)	6	792.04079	2891( 79)	0.3871( 28)	0.3850		
8 7 2	7 2 5	(000)-(000)	6	808.28026	3219( 423)	0.3802(218)	0.3730		
9 7 3	8 2 6	(000)-(000)	6	827.67165	275( SS9)	0.3s13( 77)	0.3s80	0.373S	
10 7 4	9 2 7	[000)-(000)	6	882.42377	2617( 323)	0.3342( 44)	0.3380	0.3565	
11 7 5	1 0 2 8	(000)-(000)	6	883.84453	1518( 74)	0.3208( 51)	0.3170	0.3263	
12 7 6	1 1 2 9	(000)-(000)	6	922.13S30	1806( 260)	0.2774(211)	0.2820	0.2694	
13 7 7	12 2 10	(000)-(000)	6	966.86803	-79( 79)	0.2493( 43)	0.2s00	0.2390	
14 7 8	13 2 11	(000)-(000)	6	1017.45279	1021( 79)	0.2644( 4)	0.2600	0.2411	
7 7 0	6 2 5	(000)-(000)	6	841.90290	-ss0( 393)	0.3440( 45)	0.3440		
8 7 1	7 2 6	(000)-(000)	6	881.08259	1884( 1s7)	0.3018( 27)	0.3020		
9 7 2	8 2 7	(000)-(000)	6	924.96773	1518( 74)	0.2787( 118)	0.2790		
10 7 3	9 2 8	(000)-(000)	6	973.98334	1570( 157)	0.2743( 41)	0.2740		
11 7 4	1 0 2 9	(000)-(000)	4	1028.27174	1047( 323)	0.2610( 44)	0.2610	0.2593	
13 7 6	12 2 3 1	(0001)-(000)	6	11 S3.19034	-1413( 283)	0.2286( 61)	0.2290		
1 0 8 3	9 3 6	(000)-(0001)	6	971.36478	-1963( 707)	0.3392( 86)	0.3390		
12 8 5	1 1 3 8	(000)-(000)	6	1000.28895	314( 63)	0.3s01( 44)	0.3500	0.3s77	
1 1 0	1 0 1	(020)-(010)	6	1583.35619	-45ss( 34)	0.4334( 32)	0.4630	0.4889	
1 1 0	1 0 1	(010)-(000)	8	3.609.87981	-6021( 180)	0.4650( 3S)	0.4630	0.4889	
1 1 0	1 0 1	(010)-(000)	7	1613.09223	-6264( 255)	0.4677( 22)	0.4630	0.5056	0.4889
1 1 0	1 0 1	(100)-(010)	6	2079.93401	157( 559)	0.4641(228)	0.4630	0.5056	0.4889
2 1 1	2 0 2	(020)-(010)	6	1590.36134	-6181( 1S6)	0.4271( 30)	0.4200	0.4474	0.4648
2 1 1	2 2 C 2	(010)-(000)	7	1619.98809	-1502( 484)	0.4163( 77)	0.4200	0.4474	0.4648
3 1 2	3 0 3	(020)-(010)	6	1602.72904	1417( 189)	0.4894( 10)	0.4820	0.s144	0.5590
3 1 2	3 0 3	(010)-(000)	8	1629.06134	-1061( 20)	0.4816( 37)	0.4820	0.5144	0.ss90
3 1 2	3 0 3	(010)-(000)	7	1632.16657	-1120( 170)	0.4814( 91)	0.4820	0.5144	0.s590
3 1 2	3 0 3	(010)-(000)	6	1635.65190	-1039( 391)	0.4700(160)	0.4920	0.s144	0.5590
3 1 2	3 0 3	I100I-(010)	6	2095.49S94	1465( 6S8)	0.4863( 18)	0.4820	0.5144	0.5s90
4 1 3	4 0 4	(0'40)-(010)	6	1621.12377	2S54( S22)	0.4S21( 32)	0.4720	0.384s	0.s505
4 1 3	4 0 4	(010)-(0001)	8	1647.01984	2744( 735)	0.4532(109)	0.4720	0.3945	0.5s05
4 1 3	4 0 4	(010)-(000)	7	1650.0341S	3377( 79)	0.4500( 16)	0.4720	0.384s	0.550s
S 1 4	5 0 5	(020)-(010)	6	1644.68805	-373( 214)	0.4491( 82)	0.4410	0.4834	0.s201
S 1 4	5 0 5	(010)-(000)	7	1672.19278	1998( 729)	0.4401(152)	0.4410	0.4834	0.s201
S 1 4	5 0 5	(100)-(010)	6	2126.76958	2984(1414)	0.4542(196)	0.4410	0.4834	0.5201
6 1 5	6 0 6	(0101)-(000)	8	1693.24236	1362( 990)	0.3666( 40)	0.3900	0.7048	0.4909
6 1 5	6 0 6	(010)-(000)	6	1699. S6719	463( s86)	0.4030(177)	0.3900	0.7048	0.4909
7 1 6	7 0 7	(010)-(000)	8	1714.99647	-732( 4S0)	0.3680(142)	0.3480	0.3776	0.4023
7 1 6	7 0 7	(010)-(000)	7	1720.0s825	-733( 8s4)	0.3S09( 67)	0.3480	0.3776	0.4023
7 1 6	7 0 7	(010)-(000)	6	1723.48669	-786( 78)	0.3563( 28)	0.3480	0.3776	0.4023
8 1 7	8 0 8	(010)-(000)	6	1746.29043	-2382( 11S)	0.3277( 79)	0.3130	0.3s91	0.3s48
9 1 8	9 0 9	(010)-(000)	6	1767. 911S8	-3917( 92)	0.2678( SS)	0.2600	0.2661	0.2780
1 0 1 9	10 0 10	(010)-(000)	6	1788.61384	-1385( 50)	0.2333( so)	0.2350	0.2125	0.2353
11 1 10	11 0 11	(010)-(000)	6	1800.65475	-2231( 182)	0.2076( 45)	0.20s0	0.1855	0.2050
12 1 11	12 0 12	(010)-(000)	6	1828.20792	-2087( 411)	0.1092( 25)	0.1820	0.1558	0.1704
13 1 12	13 0 13	[010)-(000)	6	1847.37881	-1441( 244)	0.1619( 44)	0.1520	0.1216	0.1286
2 2 0	2 1 1	(010)-(000)	8	1640.64910	3312( 180)	0.4380( 75)	0.4220	0.4620	0.4658
2 2 0	2 1 1	(010)-(000)	7	1644.25794	2670( 629)	0.4196( 45)	0.4220	0.4420	0.4658
2 2 0	2 1 1	(000)-(000)	6	1648.31045	2682( 275)	0.4211( 285)	0.4220	0.4620	0.4658
3 2 1	3 1 2	(020)-(030)	6	1620.33582	545( 24)	0.4561( 35)	0.4400	0.4923	0.S060
3 2 1	3 1 2	(010)-(000)	e	1638.40771	-7041( 137)	0.4463( 45)	0.4400	0.4923	0.5060
3 2 1	3 1 2	(0101)-(000)	7	1641.96896	-197( 372)	0.4560( 67)	0.4400	0.4923	0.5060
3 2 1	3 1 2	(100)-(010)	6	2092.35030	1492( 393)	0.4261( 63)	0.4400	0.4923	0.5060
4 2 2	4 1 3	(020)-(010)	6	1620.46950	236( 47S)	0.4343( 48)	0.4510	0.4673	0.5091
4 2 2	4 1 3	[010)-(000)	8	1640.07770	3113( 347)	0.4392( 80)	0.4s10	0.4671	0.5091
4 2 2	4 1 3	(010)-(000)	7	1643.52721	3s62( 604)	0.4446(176)	0.4s10	0.4671	0.5091
4 2 2	4 3 3	(010)-(000)	6	1647.40409	2966( 278)	0.4626(447)	0.4510	0.4671	0.5091
5 2 3	5 1 4	(020)-(010)	6	1626.05912	1730( 90)	0.4562( 60)	0.4s10	0.4907	0. S123
5 2 3	S 1 4	(010)-(000)	7	1650.83272	1066( 348)	0.4612( 86)	0.4510	0.4907	0.5123
6 2 4	4 1 s	(010)-(000)	8	1661.81280	3202( 383)	0.4364(129)	0.4370	0.4780	0.5335
6 2 4	6 1 5	(030)-(000)	7	1664.88S17	3219( 79)	0.4232( 37)	0.4370	0.4780	0.s33s
6 2 4	6 3 5	(010)-(000)	6	1668.28487	3139( 80)	0.4291( 11)	0.4370	0.4760	0.s33s
7 2 5	7 1 6	(020)-(010)	6	16 7. S75822	2030( 794)	0.4190( 74)	0.41s0	0.4630	0.4871
7 2 5	7 1 6	(030)-(000)	8	1682.34766	-875( 167)	0.4121( 57)	0.4150	0.4630	0.4s71
7 2 5	7 1 6	(010)-(000)	6	1688.37854	-1458( 85)	0.4141( 30)	0.41s0	0.4630	0.4871
8 2 6	8 1 7	(010)-(000)	6	1712.92261	10s0( 180)	0.4133(120)	0.3810	0.4536	0.4461
9 2 7	9 1 6	(020)-(010)	6	1711.46213	1099( 220)	0.3261(108)	0.3400	0.3692	0.3786
9 2 7	9 1 8	(030)-(000)	6	1739.318s2	603( 66)	0.34S2( S4)	0.3400	0.3692	0.3786
1 0 2 8	1 0 1 9	(010)-(000)	6	176 S.38031	-2196( 84)	0.3013( 57)	0.3030	0.3303	0.3368
1 1 2 9	11 1 10	(010)-(000)	6	1790.00770	-1582( 22)	0.2489( 55)	0.2530	0.2512	0.2648
12 2 10	12 1 11	(010)-(000)	6	1813.05044	-227'2( 394)	0.2136( 67)	0.2170	0.1980	0.2076
13 2 11	13 1 12	(010)-(000)	6	1834.77802	-1560( 620)	0.1867(102)	0.1870	0.1704	0.1800
2 2 1	2 1 2	(020)-(010)	6	1639.08392	271( 671)	0.4460( 74)	0.4780	0.s201	0. SS18
2 2 1	2 1 2	(010)-(000)	8	1655.22987	1109( 225)	0.4068( 35)	0.4780	0.5201	0.5518
2 2 1	2 1 2	(010)-(000)	7	1658.80020	417( 599)	0.4984(166)	0.4780	0.5201	0.5518
2 2 1	2 1 2	(100)-(0101)	6	2123.63298	-2s12( 314)	0.4402( 79)	0.4780	0.s201	0.5518
3 2 2	3 1 3	(010)-(000)	8	1664.0096s	1s25( 409)	0.4279(131)	0.4290	0.4099	0.4770
3 2 2	3 1 3	(010)-(000)	7	1667. S4166	1256( 471)	0.41 S2(103)	0.4280	0.4099	0.4770
4 2 3	4 1 4	(020)-(010)	6	1460.46767	1817( 31s)	0.4426( 45)	0.4390	0.4632	0.5187
4 2 3	4 1 4	(010)-(000)	7	1679.26404	55( 1067)	0.453 s(313)	0.4390	0.4632	0.5187
4 2 3	4 1 4	(000)-(010)	6	2129.71823	-1649( 133S)	0.4629( 11)	0.4390	0.4632	0.5187
S 2 4	5 1 5	(010)-(000)	6	1697.52720	-412( 148)	0.4042( 22)	0.4070	0.4279	0.479s
6 2 5	6 1 6	(010)-(000)	8	1664.63889	2205( 1126)	0.3 S99( 160)	0.3950	0.4330	0.4566
7 2 6	7 1 7	(010)-(000)	6	1732.06080	136( 230)	0.3510( 74)	0.3500	0.3587	0.3889
6 2 7	6 1 8	(010)-(000)	6	1743.07854	-1570( 1571)	0.2899(108)	0.3100	0.3204	0.32ss
9 2 8	9 1 9	(010)-(000)	6	1770.38360	-4147( 267)	0.2730( 70)	0.27s0	0.2722	0.2842
1 0 2 9	10 1 10	(010)-(000)	6	1789.87847	-1573( 35)	0.24s8( 2S)	0.2420	0.2169	0.2319
11 2 10	31 3 11	(010)-(000)	6	1809.29489	-2245( 80)	0.2126( 35)	0.2130	0.1882	0.020s
12 2 11	12 1 12	(010)-(000)	6	1828 .S3178	-3038( 266)	0.1051(120)	0.1820	0.1616	0.1704
3 3 0	3 2 1	(020)-(0101)	6	16 81.30359	6319( 417)	0.4024( 11)	0.4130	0.4765	0.4749
3 3 0	3 2 1	(010)-(0001)	8	1686.83796	4470( 01)	0.4178( 22)	0.4130	0.476s	0.4749
3 3 0	3 2 1	[010)-(000)	7	1690.89317	4158( 927)	0.4116(134)	0.4130	0.476s	0.4149
4 3 1	4 2 2	(010)-(000)	8	1661.41067	1499(1459)	0.4104(106)	0.4160	0.4110	0.4628
4 3 1	4 2 2	(010)-(000)	6	1690.13752	2114( 70)	0.4198( 25)	0.4160	0.4110	0.4628
S 3 2	5 2 3	(020							

table 2. continued

upper J KA KC	lower J KA KC	band	mol.	frequency (Cf. mutes)	shift (ohm.)	width (ohs.)	smoothed	HITRAN	BK
7 3 4	4 7 2 5	(020)-(010)	6	1660.24435	242( 667)	0.3957( 73)	0.4170	0.4776	0.5192
7 3 4	7 2 5	(010)-(000)	8	1672.60477	1944( 432)	0.4151 [128]	0.4170	0.4776	0.5192
7 3 4	7 2 5	(010)-(000)	7	1676.29883	1023( 79)	0.4048( 20)	0.4370	0.4176	0.5192
7 3 4	7 2 5	(010)-(000)	6	1690.46548	2237( 119)	0.4209( 70)	0.4110	0.4776	0. S192
8 3 5	8 2 6	(020)-(010)	6	1664.06349	628( 314)	0.4294( 5)	0.4170	0.4648	0.4786
8 3 s	8 2 6	(010)-(000)	6	1687.07795	276( 242)	0.4468(125)	0.4170	0.4648	0.4786
9 3 6	9 2 7	(010)-(000)	6	1702.74093	1884( 39)	0.4267( 80)	0.4110	0.4408	0.4876
10 3 7	1 0 2 8	(010)-(000)	6	1724.29037	183s( 701)	0.3984[ 47)	0.3920	0.4473	0.4396
11 3 8	1 1 2 9	(010)-(000)	6	17  S.37520	-412( 119)	0.3492( 40)	0.3400	0.373s	0.3804
3 3 1	3 2 2	(020)-(010)	6	1686.72350	3s33( 393)	0.3532( 44)	0.3930	0.4244	0.4644
3 3 1	3 2 2	(010)-(000)	<b>8</b>	1692.69691	2194( 687)	0.3943( 92)	0.3930	0.4244	0.4664
3 3 1	3 2 2	(010)-(000)	7	1696.67783	2669( 314)	0.3868( 5)	0.3930	0.4244	0.4664
3 3 1	3 2 2	(010)-(000)	6	1701.1s001	2598( 269)	0.3929(108)	0.3930	0.4244	0.4664
4 3 2	4 1 3	(020)-(010)	6	1689.84973	3124( 449)	0.3740(187)	0.3800	0.4269	0.4735
5 3 3	5 2 4	(010)-(000)	8	1701.97039	938( 7701)	0.4033(123)	0.3950	0.4255	0.4678
5 3 3	5 2 4	(010)-(000)	6	1710.39900	2130( 116)	0.3966( 37)	0.39s0	0.42SS	0.4678
6 3 4	6 2 5	(020)-(010)	6	1703.60008	1639( 480)	0.3341( 67)	0.3600	<b>0.4361</b>	0.4789
6 3 4	6 2 5	(010)-[000]	<b>8</b>	1710.76660	117(1038)	0.3781(182)	0.3600	0.4361	<b>0.4789</b>
6 3 4	6 2 5	(010)-[000]	7	1714 .s4849	1099( 628)	0.3s42( 74)	0.3600	0.4361	<b>0.4789</b>
6 3 4	6 2 5	(010)-(000)	6	1718.80092	542( 274)	0.3804 [213]	0.3600	0.4361	0.4789
7 3 5	7 2 6	(010)-(000)	8	1722.53721	2434( 236)	0.3116( 61)	0.3270	0.3715	0.4104
<b>7 3 5</b>	7 2 6	(010)-(000)	6	1730.34627	2293( 124)	0.3872( 63)	0.3270	<b>0.3715</b>	0.4104
8 3 6	8 2 7	(010)-(000)	8	1737.00719	1099( 942)	0.2740( 38)	0.3050	0.3504	0.3597
<b>8 3 6</b>	8 2 7	(010)-(000)	6	1744 .s9241	1446( 97)	0.3353( 44)	0.3050	0.3504	0.3597
9 3 7	9 2 8	(010)-(000)	6	1761 .04S36	2632( 160)	0.3014(126)	0.2920	0.34s1	0.35s1
<b>10 3 8</b>	10 2 9	(010)-(000)	6	1779.09236	58( 333)	0.2559( 92)	0.2660	0.3148	0.3076
1 1 3 9	11 2 10	(010)-(000)	6	1798.33387	-739( 84)	0.2218( 65)	0.2370	0.2543	0.2579
12 3 10	<b>12 2 11</b>	(010)-(000)	6	1817.67284	-1369( 298)	0.2032( 18)	0.2000	0.1963	0.2072
<b>4 4 0</b>	4 3 1	(010)-(000)	<b>8</b>	1736.32719	1178( 236)	0.3174( 25)	0.3200	0.3674	0.4062
4 4 0	4 3 1	(020)-(010)	6	1740.85897	1727 ( 345)	0.3000(129)	0.3200	0.3674	0.4062
4 4 0	4 3 1	[010]-(000)	6	1745.77615	2576( 138)	0.3458( 57)	0.3200	0.3674	0.4042
5 4 1	5 3 2	(020)-(010)	6	1738.49265	1984( 738)	0.3433(146)	0.3610	<b>0.4107</b>	0.4503
6 4 2	6 3 3	(010)-(000)	8	1727 .75577	3298( 129)	0.3879(140)	0.3850	0.4556	0.4874
<b>6 4 2</b>	6 3 3	(010)-(000)	6	1737.61661	2692( 143)	<b>0.4155( 61)</b>	0.3850	0.4886	0.4874
7 4 3	7 3 4	(010)-(000)	8	1719.76445	942( 188)	0.4089( 47)	0.3930	0.4619	0.4936
7 4 3	7 3 4	(010)-(000)	7	1724 .4 8054	-1622( 706)	0.4169(100)	0.3930	0.4619	0.4936
7 4 3	7 3 4	(020)-(010)	6	172 S. S1901	3848( 79)	0.3624( 64)	0.3930	0.4619	0.4936
7 4 3	7 3 4	(010)-(000)	6	1729 .78289	1617( 28)	0.4040( 25)	0.3930	<b>0.4619</b>	0.4936
<b>8 4 4</b>	<b>8 3 5</b>	(010)-(000)	<b>8</b>	1711.63151	-2041( 628)	0.3905( 38)	0.3980	0.43s5	0.4063
8 4 4	8 3 s	(010)-(000)	6	1721.53252	859( 241)	0.437 s(179)	<b>0.3980</b>	0.43s8	0.4063
<b>9 4 5</b>	9 3 6	(010)-(000)	6	1715.84726	-1214( 79)	0.4088( 55)	0.3930	0.4304	0.4827
1 0 4 6	1 0 3 7	(010)-(000)	6	1715. S0856	2022( 299)	0.4195( 73)	0.4130	0.4697	0.4737
1 1 4 7	1 1 3 8	(010)-(000)	6	1722.64712	2381( 24)	0.4302( 40)	0.4280	0.4703	0.4741
<b>4 4 1</b>	<b>4 3 2</b>	(010)-(000)	<b>8</b>	1737.71687	2422( 852)	0.3268(114)	0.3400	0.3733	0.4027
<b>4 4 1</b>	<b>4 3 2</b>	(020)-(010)	6	1741.94699	880( 3671)	0.326 S(169)	0.3400	0.3733	0.4027
<b>4 4 1</b>	<b>4 3 2</b>	(010)-(000)	6	1747.08236	2689( 244)	0.358s{ 51}	0.3400	0.3733	0.4027
<b>5 4 2</b>	S 3 3	(010)-(000)	8	1738.37868	<b>1806( 707)</b>	0.3284( 67)	0.3600	0.3741	<b>0.4088</b>
5 4 2	5 3 3	(020)-(010)	6	1742.46S24	-1649( 393)	0.3282(100)	0.3600	0.3741	0.4088
S 4 2	5 3 3	(010)-(000)	6	1747.72723	279.4( 127)	0.3672( 75)	0.3600	0.3741	0.4088
6 4 3	6 3 4	(020)-(010)	6	1743.80281	471( 628)	0.3523 (178)	0.355.0	0.3994	<b>0.4221</b>
6 4 3	6 2 4	(010)-(000)	6	1749.40283	3696( 114)	0.3684( 45)	0.3580	0.3994	<b>0.4221</b>
<b>7 4 4</b>	7 3 s	(010)-(000)	6	17 S. S2.81371	-1549( 194)	0.3634( 97)	0.3520	0.3387	0.3803
0 4 4 s	8 3 6	(010)-(000)	6	175s.58151	-371( 58)	0.3430( 82)	0.3450	0.354s	0.3687
9 4 6	9 3 1	(010)-(000)	6	1767.09170	-246( 154)	0.3123( 86)	0.3200	0.3682	0.3763
3 0 4 7	1 0 3 8	(010)-(000)	6	1776.41634	189S( 248)	0.2982( 91)	0.2880	0.3ss5	0.3s04
11 4 8	<b>11 3 9</b>	(010)-(000)	6	1792.33062	<b>2428( 267)</b>	0.2597(137)	0.2860	0.3127	0.3090
12 4 9	1 2 3 10	(010)-(000)	6	1808.37202	31316( 85)	0.2184( 25)	0.2100	0.2513	0.2894
1 3 4 1 0	1 3 3 11	(010)-(000)	6	1825.97418	-942( 628)	0.1976( 2)	0.1960	0.2341	<b>0.2358</b>
5 5 0	<b>5 4 1</b>	(010)-(000)	6	179s.80190	-897( 89)	0.3106( 28)	0.3110	0.3104	0.3325
6 S 1	6 4 2	(010)-(000)	6	1795.099S9	12S9( 192)	0.3496( 60)	0.3440	0.3644	0.3792
7 5 2	7 4 3	(010)-(000)	6	1792.93000	<b>2780( 109)</b>	0.3687( 50)	0.3630	0.3746	0.3971
8 s 3	0 4 4	(010)-(000)	6	1788.356S3	1454( 257)	0.3651( 91)	0.3620	0.4031	0.4132
<b>9 5 4</b>	9 4 5	(010)-(000)	6	1780.61066	1696( 190)	0.3758(279)	0.3990	0.3972	0.41SS
1 0 5 1	S 5 1 0 4 6	(010)-(000)	6	1770.94765	2438( 151)	0.4043( 17)	0.4030	0.4287	0.4359
3 1 5 6	1 1 4 7	(010)-(000)	6	1760.85950	1330( 330)	0.4148(100)	0.4090	<b>0.4822</b>	<b>0.4717</b>
5 5 1	S 4 2	(010)-(000)	6	1796 .02683	-1274( 65)	0.3080(108)	0.3010	0.2920	0.3235
6 S	2 6 4 3	(010)-(000)	6	1796.13240	14( 62)	0.3164( 22)	<b>0.3080</b>	0.3259	0.3476
7 s 3	7 4 4	(010)-(000)	6	1796.29758	-42( 108)	0.3170( 74)	0.3140	0.3177	0.3489
8 5 4	8 4 4 s	(010)-(000)	6	1796.92445	714( 232)	0.3223( 80)	<b>0.3180</b>	0.3475	0.3829
9 s 5	9 4 6	(010)-(000)	6	1798.59095	174( 51)	0.3360( 25)	0.3240	0.3601	0.3655
1 0 5 6	1 0 4 7	(010)-(000)	6	1801.02946	-297( 158)	0.3213( 61)	0.3170	0.34s7	0.3526
<b>11 5 7</b>	<b>11 4 8</b>	(010)-(000)	6	1807.47946	-174( B34)	0.2869(163)	0.2880	0.3049	<b>0.3181</b>
1 2 5 8	1 2 4 9	(010)-(000)	6	1815.56S07	417( 340)	0.2 S7S(120)	0.2510	0.2911	0.2694
1 3 s	9 1 3 4 1 0	(010)-(000)	6	1826.25106	-1256( 628)	0.2108( 44)	0.2130	0.2321	0.2522
6 6 0	6 5 3	(010)-(000)	6	1845.33033	-870( 292)	0.2403{ 63}	0.2400	0.2420	
7 6 1	7 5 2	(010)-(000)	<b>8</b>	1834.51737	-1413( 283)	0.2602(102)	0.2680	0.2740	
7 6 1	7 5 2	(010)-(000)	6	1845. S9808	565( 151)	0.2726( 63)	0.2680	0.2740	
<b>8 6 2</b>	8 5 3	(010)-[000]	6	1845.23067	1747( 20)	0.3018( 64)	0.2920	0.3221	
9 6 3	9 5 4	(010)-(000)	6	1843.71600	<b>1255( 167)</b>	0.3091( 50)	0.31s0	<b>0.3280</b>	
1 0 6 4	1 0 5 5	(010)-(000)	6	1840.29814	-122( 47s)	0.3309( 64)	0.3330	<b>0.3687</b>	
1 1 6 s	1 1 5 6	(010)-(000)	6	1834.14907	408( 649)	0.363 S(109)	0.3520	0.3994	
13 6 7	<b>13 5 8</b>	(010)-(000)	6	1813.37876	-2591( 393)	0.3699( 57)	0.3630	0.4341	0.4363
6 6 1	6 5 2	(010)-(000)	8	1834.36800	-2669( 157)	0.2100( 57)	0.2470	0.2401	0.2519
6 6 1	6 5 2	(010)-(000)	6	1845.36397	-384( 142)	0.2463( 79)	0.2470	<b>0.2401</b>	0.2519
7 6 2	7 5 3	(0101)-(000)	6	1845.78401	387( 170)	0.2665( 54)	0.2620	<b>0.2686</b>	<b>0.2830</b>
<b>B 6 3</b>	<b>8 5 4</b>	(010)-(000)	6	<b>1845.95703</b>	579( 703)	0.2748(146)	0.2860	<b>0.3078</b>	0.3031
9 6 4	9 5 5	(010)-(000)	6	1845.94902	-1455( 743)	0.2732 [217]	0.2950	0.3166	0.3177
1 0 6 5	1 0 5 6	(010)-(000)	6	1845.98629	<b>-870( 1120)</b>	0.3112(120)	0.2970	0.3260	0.3248
11 6 6	1 1 5 7	(010) -[000]	6	1846.46696	-133S( 79)	0.2849( 60)	0.2080	0.307s	0.3131
7 7 0	7 6 1	{010)-(000)	6	1893.71712	-36 S(1105)	0.2395(115)	<b>0.2180</b>	0.	

table 2. Cont inued

upper	lower			frequency	shift	width			
J KA KC	J KA KC	band	mol.	(computed)	(chrs.)	lobs.)	smoothed	HITRAN	BK
<b>9</b> <b>8</b> <b>1</b>	9 7 2	{010}-{(000)}	6	1941.02031	-3800{ 900)	0.18 S0(170)	0.1880	0.1846	0.1886
<b>10</b> <b>8</b> <b>2</b>	1 0 7 3	(010)-{(000)}	6	1943.13984	-79(1021)	0.1980( 32)	0.2030	0.2189	0.0218
1 1 8 3	1 1 7 4	(010)-{(000)}	6	1944 .07063	-2277(1178)	0.2265( 16)	0.2080	0.2376	0.2404
8 8 1	<b>8</b> <b>7</b> <b>2</b>	(010)-{(000)}	6	1940.26741	-2453( 650)	0.1685( 44)	0.1680	0.1498	0.1529
1 0 8 3	1 0 7 4	(010)-{(000)}	6	1943.16300	-628( 1261	0.2048( 2)	0.2030	<b>0.2184</b>	0.2173
9 9 C	<b>9</b> <b>8</b> <b>1</b>	(010)-{(000)}	6	1984 .45521	-1884( 785)	0.1s89( 57)	0.1430	0.1324	0.1364
<b>10</b> <b>9</b> <b>2</b>	<b>10</b> <b>8</b> <b>3</b>	(010)-{(000)}	6	1986.65832	-3377( 79)	0.1690( 35)	0.1620	0.1600	0.1650
<b>3</b> <b>3</b> <b>C</b>	3 0 3	(010)-{(000)}	6	1770.85414	-270( 170)	0.4506( 80)	0.4800	0.4661	0.207
4 3 1	4 0 4	(010)-{(000)}	6	1783.86430	3014( 297)	0.421%( 88)	0.4500	0.4389	0.4766
<b>5</b> <b>3</b> <b>2</b>	5 0 5	(010)-{(000)}	6	1805.14642	2111( <b>184</b> )	0.4330(119)	0.4480	0.4291	0.5074
6 3 3	6 0 6	(010)-{(000)}	6	183s.89309	1155( 66)	0.4303( 54)	0.4380	0.4228	0.4924
<b>7</b> <b>3</b> <b>4</b>	7 0 7	[010]-{(000)}	6	1876.63177	-1961( 10s)	0.418s( 40)	0.4200	0.3841	0.4764
<b>8</b> <b>3</b> <b>5</b>	8 0 8	(010)-{(000)}	6	1926.72600	-2984( 943)	0.4067( 64)	0.3970	0.3283	
9 3 6	9 0 9	(010)-{(000)}	6	1984.50210	-2669( 314)	0.3897( 63)	0.3800	0.3009	0.4080
1 3 3 1 0 1 3 0 1 3	{000)-{(000)}	6	608.05336	-733(1859)	0.2 S30(135)	0.2600	0.2378		
4 4 0	4 1 3	(010)-{(0001)	6	1054.12166	4317( 849)	0.4202(102)	0.4270	0.4389	0.4720
<b>5</b> <b>4</b> <b>1</b>	<b>1</b> <b>5</b> <b>1</b> <b>4</b>	[010]-{(000)}	6	1652.40504	1753( 57)	0.4153( 57)	0.4170	0.4291	0.4688
<b>6</b> <b>4</b> <b>2</b>	6 1 S	(010)-{(000)}	6	18 S.28976	2754( 78)	0.4002( 28)	0.4100	0.4228	0.478s
7 4 3	7 1 6	(010)-{(000)}	6	1867 .92S1S	1628(1297)	0.3699(236)	0.4000	0.3841	0.4409
8 4 4	8 1 7	(010)-{(000)}	6	1808.77905	1s7s( 12s)	0.4036(117)	0.3880	0.3283	0.4288
9 4 5	<b>9</b> <b>1</b> <b>8</b>	[0101]-{(000)}	6	1919.68660	251( S80)	0.3700( 71)	0.3720	0.3009	0.4000
<b>10</b> <b>4</b> <b>6</b>	1 0 1 9	(010)-{(000)}	6	1960.71986	-3376( 393)	0.3643( 32)	0.3620	0.2618	0.3997
1 1 4 1	<b>11</b> 1 10	(010)-{(000)}	6	2011.02258	-393( 79)	0.3648( 611)	0.3600	0.2600	0.4087
4 4 1	4 1 4	(010)-{(0001)	6	1904.76088	4465( 335)	0.4109( 55)	0.4120	0.4389	<b>0.4588</b>
5 4 2	5 1 5	(010)-{(000)}	6	1925.06989	157( 314)	0.3782( O)	0.3730	0.4291	0.4140
6 4 3	<b>6</b> <b>1</b> <b>6</b>	(010)-{(000)}	6	1951.12921	3982( 436)	0.3469(108)	0.3420	0.4228	0.404s
7 4 4	7 1 7	(010)-{(000)}	6	1983.02888	198( 706)	0.3346( 57)	0.3300	0.3841	0.3815
<b>8</b> <b>4</b> <b>5</b>	<b>8</b> <b>1</b> <b>8</b>	(010)-{(000)}	6	2020. S3461	576( S18)	0.3238( 30)	0.3200	0.3283	0.3630
<b>5</b> <b>5</b> <b>0</b>	<b>5</b> <b>2</b> <b>3</b>	(010)-{(000)}	6	19 <b>59</b> .63251	<b>5575</b> ( 393)	0.3s7s( 41)	0.3580	0.4291	0.3980
4 5 1	6 2 4	(010)-{(000)}	6	19 S.10636	34ss( <b>157</b> )	0.3940( 11)	0.3880	<b>0.4228</b>	0.4s41
<b>7</b> <b>5</b> <b>1</b>	<b>7</b> <b>2</b> <b>5</b>	(010)-{(000)}	6	1941.75733	3S15( 464)	0.3902(151)	0.3950	0.3841	0.4427
<b>8</b> <b>5</b> <b>3</b>	8 2 6	(010)-{(000)}	6	1937.22040	0( 628)	0.3706( 37)	0.3720	0.3283	0.4311
9 5 4	9 2 7	[010]-{(000)}	6	1939.12452	166s( 508)	0.3497( 94)	0.3s00	0.3009	0.3889
<b>10</b> <b>5</b> <b>5</b> <b>1</b> <b>0</b> <b>2</b> <b>8</b>	{010)-{(0001)}	6	1949.43216	<b>1204</b> ( 606)	0.3202( 88)	0.3220	0.2818	0.3913	
1 1 5 6 1 2 9	{010)-{(000)}	6	1969.23968	-471(157)	0.3303( 23)	0.3280	0.2600	0.3838	
<b>5</b> <b>5</b> <b>1</b>	<b>5</b> <b>2</b> <b>4</b>	(010)-{(000)}	6	1989.93226	<b>2777</b> ( 236)	0.3397(126)	0.3680	0.4291	0.4108
<b>6</b> <b>5</b> <b>2</b>	6 2 S	(010)-{(000)}	6	1999.94595	1256( 785)	0.3336( 91)	0.3270	0.4228	0.4094
7 5 3	7 2 6	(010)-{(000)}	6	2014.43334	<b>2827</b> ( 786)	0.3159( 94)	0.3100	0.3841	0.3612
8 5 4	8 2 7	(010)-{(000)}	6	2034.03270	2041( 256)	0.289s( <b>88</b> )	<b>0.2880</b>	0.3283	0.3371
9 6 3	9 3 4	(010)-{(000)}	6	2038.09425	707( 79)	0.3424(185)	0.3720	0.3009	0.4065
<b>8</b> <b>7</b> <b>1</b>	<b>8</b> <b>2</b> <b>6</b>	{000)-{(000)}	6	601.77906	-2827( 472)	0.3369(100)	0.3370		
9 7 2	9 2 7	{000)-{(000)}	6	608.66641	3769(1096)	0.3347( 94)	0.3380	0.3009	
<b>8</b> <b>7</b> <b>2</b>	8 2 7	{000)-{(000)}	6	705.08986	785( 157)	0.2706( 11)	0.2710		
3 3 1	4 0 4	(010)-{(000)}	6	168 S.39867	3483( 727)	0.4330(175)	0.4380	0.4389	
<b>4</b> <b>3</b> <b>2</b>	<b>5</b> <b>0</b> <b>5</b>	(010)-{(000)}	6	1679.46781	3465( 42)	0.4126( 11)	0.4180	0.4291	
6 3 4	7 0 7	(010)-{(000)}	6	168 S.46872	2856( 117)	0.3773( 11)	0.3800	0.3841	
<b>8</b> <b>3</b> <b>6</b>	9 0 9	(010)-{(000)}	6	1710.02426	-1320( 220)	0.2110(120)	0.3210	0.3009	
5 4 2	6 1 <b>5</b>	[010)-{(000)}	6	1700.78989	2327( 907)	0.3821( 41)	0.3820	0.4228	
6 4 3	7 1 6	(010)-{(000)}	6	1694.16747	2020( 4s)	0.3842( S0)	0.3840	0.3841	
7 4 4	<b>8</b> <b>1</b> <b>7</b>	(010)-{(000)}	6	1686.6176s	2041( 314)	0.3377( 25)	0.3s30	0.3283	
8 4 S	9 1 8	[010]-{(000)}	6	1685.61788	1990(1351)	0.3167( 97)	<b>0.3270</b>	0.3009	
2 2 0	3 1 3	(020)-{(010)}	6	1577.72690	2748(1178)	0.4750 [105]	0.4490	0.4013	0.4937
2 2 0	3 1 3	{010)-{(000)}	8	1593.86968	785( 314)	0.4200( 35)	0.4490	0.4813	0.4937
<b>2</b> <b>2</b> <b>0</b>	3 1 3	(010)-{(000)}	6	1601.20790	416( 68)	0.4563(129)	0.4490	0.4813	0.4937
3 2 1	4 1 4	(020)-{(010)}	6	1571.15252	2041( 314)	0.476s( <b>45</b> )	0.4500	0.5015	0.s280
<b>3</b> <b>2</b> <b>1</b>	<b>4</b> <b>1</b> <b>4</b>	(010)-{(000)}	8	1587.46207	1s7( 314)	0.4407( <b>38</b> )	0.4s00	0.s01s	0.5280
3 2 1	<b>4</b> <b>1</b> <b>4</b>	(010)-{(000)}	7	1590.77482	-1151( 196)	0.4540( 28)	0.4500	0.5015	0.5280
3 2 1	4 1 4	(010)-{(000)}	6	1594.49676	119( 93)	0.4569( 55)	0.4s00	0.s01s	0.s280
<b>4</b> <b>2</b> <b>2</b>	5 1 s	(020)-{(010)}	6	1573.11013	-2905( 79)	0.4036( 68)	0.4420	0.453s	0. s071
<b>4</b> <b>2</b> <b>2</b>	<b>5</b> <b>1</b> <b>5</b>	(010)-{(000)}	6	1596.27563	-4004( 141)	0.4484( 109)	0.4420	0.453s	0. s071
5 2 3	6 1 6	(020)-{(010)}	6	1584.16880	-2120( 79)	0.4321( 65)	0.4400	0.4391	0.4777
<b>5</b> <b>2</b> <b>3</b>	6 1 6	(010)-{(000)}	8	1600. S7644	236( <b>550</b> )	0.4420 [105]	0.4400	0.4391	0.4777
<b>5</b> <b>2</b> <b>3</b>	6 1 6	(010)-{(000)}	6	1606.71639	-2322( 115)	0.4496( 105)	0.4400	0.4391	0.4777
6 2 4	7 1 7	(010)-{(000)}	6	1624.71148	<b>-620</b> ( 260)	0.4270( S4)	0.4370	0.4602	0.4926
9 2 7 1	0 1 1 0	(010)-{(000)}	6	1703.84821	680( 8s4)	0.3249( 159)	0.3280	0.3s39	0.3529
2 2 1	3 1 2	(010)-{(000)}	8	1561.33561	3s17( 708)	0.4776(331)	0.4680	0.5165	0.5485
<b>2</b> <b>2</b> <b>1</b>	3 1 2	(010)-{(000)}	6	1568.93986	3s24( 118)	0.4752( 80)	0.4680	0.5165	0.s48s
<b>3</b> <b>2</b> <b>2</b>	4 1 3	(010)-{(000)}	8	1s30.77350	<b>365</b> ( 449)	0.4517(117)	0.4370	0.4479	0.5082
3 2 2	<b>4</b> <b>1</b> <b>3</b>	(010)-{(000)}	6	1538.29056	<b>1206</b> ( 502)	0.441s( 44)	0.4370	0.4479	0. s082
4 2 3	5 1 4	(010)-{(000)}	8	1801.24842	<b>-138</b> ( 185)	0.4642( 22)	0.4500	0.s092	0.s290
4 2 3	<b>5</b> <b>1</b> <b>4</b>	(010)-{(000)}	7	1804.68967	1021( 79)	0.4448( 11)	0.4s00	0.5092	0. s290
4 2 3	5 1 4	(010)-{(0001)	6	1508. <b>55884</b>	-s8-( 156)	0.4647(325)	0.4500	0.s092	0.5290
5 2 4	6 1 s	(020)-{(010)}	6	14 S2.2S220	1178( 236)	0.3992( 30)	0.4220	0.4821	0.s101
S 2 4	6 1 s	(010)-{(000)}	8	1474.27379	<b>-980</b> ( <b>550</b> )	0.4167( S4)	0.4220	0.4021	0.s101
5 2 4	6 1 5	[010)-{(000)}	7	1477.55486	314( 157)	0.431s( 91)	0.4220	0.4821	0.5101
5 2 4	6 1 S	(010)-{(000)}	6	1401.24609	-142( 221)	0.4317( 37)	0.4220	0.4821	0.5101
6 2 5	7 3 . 6	(020)-{(010)}	6	1426.44052	-1( 745)	0.3757(105)	0.3800	0.4212	0.4507
<b>6</b> <b>2</b> <b>5</b>	<b>7</b> <b>1</b> <b>6</b>	(010)-{(000)}	8	14 <b>50.48779</b>	-333( 276)	0.3673( 64)	0.3800	0.4212	0.4507
6 1 S	<b>7</b> <b>1</b> <b>6</b>	(010)-{(000)}	7	14s3. s8s4s	-785( 897)	0.3600( 41)	0.3800	0.4212	0.4507
<b>6</b> <b>2</b> <b>5</b>	7 1 6	(010)-{(000)}	6	1457.07199	-835( 255)	0.3717(200)	0.3800	0.4212	0.4507
<b>7</b> <b>2</b> <b>6</b>	<b>8</b> <b>1</b> <b>7</b>	(020)-{(010)}	6	1403.81367	-994( 64S)	0.3164(132)	0.3220	0.4100	0.3888
7 2 6	8 1 7	(010)-{(000)}	8	1429.41119	1021( 864)	0.2979( 22)	0.3220	0.4100	0.3858
7 1 6	<b>8</b> <b>1</b> <b>7</b>	(010)-{(000)}	7	1432.34673	<b>550</b> ( 236)	0.3060( 17)	0.3220	0.4100	0.3858
7 2 6	0 1 7	(010)-{(000)}	6	1435.64957	1086( 32)	0.3299( 47)	0.3220	0.4300	0.3858
<b>8</b> <b>2</b> <b>7</b>	<b>9</b> <b>1</b> <b>8</b>	(020)-{(010)}	6	1383 .6s330	707( 393)				

table 2. continued

<b>upper J KA KC</b>	<b>lower J KB KC</b>	<b>band</b>	<b>f requency (computed)</b>	<b>shift (chm.)</b>	<b>width (obs.)</b>	<b>Smooth*,a</b>	<b>EITRAN</b>	<b>BK</b>
5 3 2	6 2 5	[020]-(010)	6	1861.44497	2094 (13S9)	0.3663(100)	0.4040	0.46S1 0.4939
5 3 2	6 2 5	(010)-(000)	7	1573.56945	-5s0 ( 79)	0.3876( 88)	0.4040	0.4651 0.4939
5 3 2	6 2 5	[010]-(000)	6	1577.58292	<b>-328( 99)</b>	0.4347(1141	0.4040	0.46S1 0.4939
6 3 3	7 2 6	[010]-(000)	6	1572.98142	194( 286)	0.3852( 86)	0.4010	0.4224 0.4642
7 3 4	8 2 7	(010)-(000)	6	1577.27508	-3959( 162)	0.3793( 73)	0.3970	0.4528 0.4577
8 3 5	9 2 8	(010)-(000)	6	1590.40421	-1486( 603)	0.4072( 74)	0.3900	0.4011 0.4297
9 3 6	10 2 9	(ClO)-(000)	6	1611.03641	-802( 106S)	0.3907( 74)	0.3740	0.3812 0.4012
<b>3 3 1</b>	<b>4 2 2</b>	(010)-(000)	<b>8</b>	1582.99336	4319( <b>550</b> )	0.3945( 11)	0.4200	0.4364 0.4689
3 3 1	4 2 2	(010)-(000)	6	1591.67189	4686( 308)	0.4174(138)	0.4200	0.4364 0.4689
4 3 2	5 2 3	[020]-(010)	6	1543.89733	4003 (12s7)	0.4204( 91)	0.4370	0.4141 0.4690
<b>4 3 2</b>	<b>5 2 3</b>	[0101-(000)	7	1553.66985	290s ( 707)	0.3977(1771	0.4370	0.4141 0.4690
4 3 2	5 1 3	(010)-(000)	6	1558.30505	4046( 367)	0.4099(177)	0.4370	0.4141 0.4690
<b>5 3 3</b>	<b>6 2 4</b>	(010) -[000]	6	1523.63426	3124( 199)	0.4 S62( <b>68</b> )	0.4300	0.4756 0. S033
6 3 4	7 2 5	(010)-(000)	<b>8</b>	1480.76467	3219( 236)	0.3906( 2)	0.4100	0.4744 0. s013
6 3 4	7 2 5	(010)-(000)	7	1484.78060	1335( 236)	0.4029( 71)	0.4100	0.4744 0. s013
<b>6 3 4</b>	<b>7 2 5</b>	(010) -[000]	6	1489.30243	3233( 114)	0.4087( 53)	0.4100	0.4744 0. s013
7 3 5	8 2 6	(010) -[000]	<b>8</b>	1440.91266	-942( 628)	0.3828( 41)	0.3810	0.4317 0.4399
<b>8 3 6</b>	<b>9 2 7</b>	(020)-(010)	6	1406.18846	<b>-2198( 314)</b>	0.37701( 35)	0.3s80	0.3899 0.4020
6 3 6	9 2 7	(010)-(000)	8	1420.72168	-262( 148)	0.3422(109)	0.35s0	0.3899 0.4020
6 3 6	9 2 7	(010)-(000)	6	1426.27109	322( 126)	0.3707(1081	0.3SS0	0.3899 0.4020
<b>9 3 7</b>	<b>10 2 8</b>	(010)-(000)	6	1403. (6221	485( 55)	0.3299( 71)	0.3350	0.3710 0.3722
<b>10 3 8</b>	<b>11 2 9</b>	(0101)-(000)	6	1382.06199	680 ( 227)	0.2698( 55)	0.2900	0.3043 0.3032
<b>11 3 9</b>	12 2 10	1010)-(000)	6	1363.06250	2004( 94)	0.2777( 17)	0.2600	0.2347 0.2476
<b>12 3 10</b>	13 2 11	(010)-(000)	6	134s. s3915	-2S13 ( 786)	0.2269( 4S)	0.2170	0.1996 0.2109
<b>13 3 11</b>	<b>14 2 12</b>	{010)-(000)	6	<b>1328. <b>83829</b></b>	79 ( 79)	0.1786( 4)	0.1800	0.1856 0.0188
4 4 0	5 3 3	(010)-(000)	6	1625.65054	3294( 370)	0.3s71( <b>63</b> )	0.3400	0.3723 0.3987
5 6 1	6 3 4	(010)-(000)	<b>8</b>	3. S93 .77442	1649( 707)	0.3483( 63)	0.3490	0.4110 0.4229
S 4 1	6 3 4	(010)-(000)	6	1602.88381	1804( 96)	0.3064( 94)	0.3490	0.4110 0.4229
<b>6 4 2</b>	<b>7 3 5</b>	(010)-(000)	6	1582.47120	-733( 172)	0.3327(132)	0.3530	<b>0.3814</b> 0.4132
7 4 3	8 3 6	(010)-(000)	6	1566.02322	4104 ( 95)	0.3440( <b>51</b> )	0.3670	0.4153 0.4118
8 6 6	9 3 7	[010)-(000)	6	155. S45886	1924( 334)	0.3824( 68)	0.3730	0.3880 0.4086
9 4 5	1 0 3 8	(010)-(0001	6	1552.63810	247( 790)	0.373s( 22)	0.3720	0.4044 0.4091
1 1 4 7	<b>12 3 10</b>	(010)-(000)	6	1573.36340	-2434( 236)	0.3821( 16)	0.3570	0.3848 0.3959
4 4 1	5 3 2	(010)-(000)	<b>8</b>	1611.27965	1806( 393)	0.3631( 74)	0.3640	0.3858 0.4262
<b>4 4 1</b>	<b>5 3 2</b>	(010)-(000)	6	1620.78713	<b>2078( 15s)</b>	0.3770(100)	0.3640	0.3858 0.4262
<b>5 4 2</b>	6 3 3	(010)-(000)	8	1500.36485	2355( 314)	0.3742( 43)	0.3910	0.4233 0.4581
<b>5 4 2</b>	6 3 3	(010)-(000)	6	1590.14643	3561( 293)	0.4105( 77)	0.3910	0.4233 0.4581
6 4 3	7 3 4	(010)-(000)	6	15 S6 .02491	<b>2100( 183)</b>	0.423 S(158)	0.4060	0.4267 0.4683
1 4 4 4	8 3 5	(010)-(000)	6	1519.35032	2011( 57)	0.4029( 47)	0.4100	0.4106 0.4349
8 4 5	9 3 6	(010)-(000)	6	1481.77834	304( 170)	0.3927( <b>83</b> )	0.4000	0.4248 0.4417
9 4 6	1 0 3 7	(010)-(000)	6	1445.17363	S00 ( 600)	0.3990 [109]	0.3970	0.4554 0.4S06
1 0 4 7	1 1 3 8	(010)-(000)	6	1411.32320	401( 252)	0.3684( 3S)	0.3630	0.3916 0.4016
1 1 4 8	1 2 3 9	(010)-(000)	6	1381.53133	S23( 148)	0.3215(112)	0.3200	0.336S 0.3479
1 2 4 9 1	3 3 1 0	(010)-(000)	6	1356.15551	<b>-864( 393)</b>	0.2679( 48)	0.2750	0.2709 0.2783
5 5 0	<b>6 4 3</b>	(010)-(000)	6	1649.41830	<b>-110( 1ss)</b>	0.3084( 40)	0.3070	0.3001
6 5 1	<b>7 4 4</b>	(010)-(000)	6	1625.13586	17s ( 204)	0.31s8( <b>55</b> )	0.3100	0.3079
1 5 2	<b>8 4 5</b>	(010)-(000)	6	1601.45860	1150( <b>34</b> )	0.3273( 32)	0.3120	0.3412
8 5 3	<b>9 4 6</b>	(010)-(000)	6	1579.24718	<b>-2021( 289)</b>	0.3436(143)	0.3400	0.3580
6 5 2	7 4 3	(010)-(000)	6	1621.62013	313s ( <b>48</b> )	0.3600( 20)	0.3400	0.3609 0.3824
7 5 3	<b>8 4 6</b>	(010)-(000)	6	1592.26s94	3150( 120)	0.368S( 61)	0.3570	0.3885 0.3967
8 5 6	9 4 5	(010)-(000)	6	1559.39762	3363( 93)	0.3697(182)	0.3830	0.4063 0.4134
1 0 5 6	<b>11 4 7</b>	{0101)-(000)	6	1484 .28732	3'206(104S)	0.3983( so)	0.3920	0.4421 0.4464
1 1 5 7	1 2 4 8	(010)-(000)	6	1444.05624	-2591( 79)	0.3759( 60)	0.3680	0.4275 0.4351
1 2 5 0	<b>13 4 9</b>	(010)-(000)	6	1406.72624	1099 ( 471)	0.3384< 20)	0.3370	0.3725 0.3836
6 6 0	7 5 3	(010)-(000)	6	1674.31630	-157( 471)	0.2573( 17)	0.2600	0.2490 0.2648
7 6 1	<b>8 5 4</b>	(010)-(000)	6	16 S0 .24679	1153( <b>744</b> )	0.2817( 71)	<b>0.2880</b>	0.2954 0.2908
8 6 2	9 s s	(010) -[000]	6	1626.16144	0 ( <b>587</b> )	0.2909( <b>51</b> )	0.2900	0.3080 0.3080
9 6 3	1 0 S 6	(010)-(000)	6	1602.294S6	-1181( 890)	0.2878( 18)	0.2900	0.3280 0.3137
<b>10 6 6</b>	<b>11 5 7</b>	(010)-(000)	6	1579.21868	<b>-2748( 236)</b>	0.2910 (145)	0.2950	0.3106 0.3094
6 6 1	7 s 2	(010)-(000)	6	1674.12728	<b>87( <b>481</b>)</b>	0.2636( 63)	0.2610	0.2547 0.2709
7 6 3	0 S 3	(010)-(000)	6	1649. S1909	2063( 979)	0.2 S95(214)	0.2810	0.3072 0.3061
0 6 3	9 5 4	(010)-(000)	6	1623.02642	1792( 379)	0.2982( 74)	0.3020	0.3123 0.3226
1 0 6 5	s 1 1 s 6	(010)-(000)	6	1565.70972	<b>-890( 834)</b>	0.3568( 70)	<b>0.3480</b>	0.39s3 0.3891
7 7 0	S 6 3	(010)-(000)	6	1698.30017	-2879( 658)	0.2290(351)	0.2200	0.2065 0.2051
7 7 1	<b>8 6 2</b>	(010)-(000)	6	1698.26963	-2198( 942)	0.2089(131)	0.2200	0.2080 0.0205
<b>10 7 4</b>	<b>11 6 5</b>	(010)-(000)	6	1626.66508	<b>942( <b>188</b>)</b>	0.3109( 33)	0.3000	0.2902 <b>0.2888</b>
0 0 0	1 1 1	(010)-(000)	<b>8</b>	15 S1 .S2702	4478( 186)	0.4802( 57)	0.4000	0. S060 0. S026
1 0 1	<b>2 1 2</b>	{020)-(010)	6	1498.37989	3027( 90)	0.4436( 13)	0.4190	0.4922 0.4996
1 0 1	2 1 2	(010)-(000)	<b>8</b>	1533.05736	3578( 1196)	0.4312( 251)	0.4190	0.4922 0.4996
1 0 1	2 1 2	(010)-(000)	7	1535.88770	4094( 204)	0.4352( 43)	0.4190	0.4922 0.4996
<b>2 0 2</b>	> 1 3	(020)-(010)	6	1482.47745	4950( 80)	0.420S( 3S)	0.4220	0.4343 0.4004
<b>2 0 2</b>	3 1 3	(010)-(000)	7	1522.68612	617 ( 376)	0.4100(200)	0.4220	0.4343 0.4804
3 0 3	4 1 4	(020)-(010)	6	1467.64S69	<b>-2089( 9s)</b>	0.4608( 2)	0.4830	0. S420 0.5659
3 0 3	4 1 4	(010)-(000)	<b>8</b>	<b>1501. <b>18834</b></b>	76 ( 54)	0.4971( <b>32</b> )	0.4830	<b>0.5420</b> 0. S6S9
3 0 3	4 1 4	(010)-(000)	7	1503.95603	<b>-488( 110)</b>	0.4927( 83)	0.4830	0.5420 0.5659
3 0 3	4 1 4	(010)-(000)	6	1507 .0s833	-1890( 299)	0.4900(299)	0.4830	0. S420 0. S659
3 0 3	4 1 4	(100)-(010)	6	1969.77s34	864 ( 236)	0.4984(108)	0.4830	0. S420 0. S659
4 0 4	5 1 s	(020)-(010)	6	14 S 2 .46670	-3620( 307)	0.4338(1061	0.45s0	0.4923 0.5172
4 0 4	5 1 s	(010)-(000)	<b>8</b>	1484 .971s0	-4440( 271)	0.4545( 40)	0.45s0	0.4923 0. S172
4 0 4	5 1 s	(010)-(000)	7	1487. 73172	-4069( 1364)	0.45 S1 (188)	0.4830	0.4923 0. S172
4 0 4	5 1 s	(010)-(000)	6	1490 .82871	-4621( 265)	0.4500(350)	0.45s0	0.4923 0. S172
<b>5 0 5</b>	<b>6 1 6</b>	[020)-(0101	6	1436.23313	1982( S49)	0.4379( 91)	0.4220	0.4338 0.4757
<b>5 0 5</b>	<b>6 1 6</b>	(010)-(000)	8	1467.67641	2343( 201)	0.4247( 63)	0.4220	0.4338 0.4787
S 0 S	<b>6 1 6</b>	(010)-(000)	7	1470.42862	2490( 275)	0.4229( 47)	0.4220	0.4338 0.4757
5 0 S	6 1 6	(010)-(000)	6	1473 .S1420	200s ( 672)	0.42s0(200)	0.4220	0.4338 0.47s7
5 0 S	6 1 6	(100)-(0101	6	1933. ss474	2434( 7071	0.4097( <b>18</b> )	0.4220	0.4338 0.4757
6 0 6	7 1 7	(010)-(000)	8	2.449.50217	-s37( 2501	0.3634( <b>77</b> )	0.3620	0.3890 0.409s
6 0 6	7 1 7	(010) -[000]	6	1455. 30138	-s37( 54)	0.39 S0(109)	0.3620	0.3590 0.4095
7 0 7	<b>8 1 8</b>	{020)-(010)	6	1400.9422S	<b>10B( 220)</b>	0.3226( 35)	0.3200	0.3719 0.3432
7 0 7	<b>8 1 8</b>	(010)-(000)	8	1430.74200	233( <b>141</b> )	0.33s6( 41)	0.3200	0.3719 0.3432
<b>8 0 8</b>	9 1 9	(020)-(010)	6	1382.42327	-1021( 79)	0.2729( <b>35</b> )	0.2670	0.3829 0.2853
<b></b>								

table 2 cont. inued

upper J KA KC	lower J KA KC	band	mol.	frequency (computed)	shift (cm⁻¹)	width (obs.)	smoothed	HITRAN	BK
11 0 11	12 1 12	(C10)-(000)	8	13 S2.63884	1570( 471)	0.2004( 45)	0.2070	0.1701	0.1855
11 0 11	12 2 12	(C10)-(000)	6	1358.02662	1046( 139)	0.2043( 63)	0.2070	0.1701	0.1855
12 0 12	13 1 13	(C10)-(000)	6	1337.89775	1563( 593)	0.1905( 50)	0.1900	0.1446	0.1511
13 0 13	14 1 14	(C10)-(000)	6	1317.61046	1685( 617)	0.1620( 32)	0.1660	0.1108	0.1157
15 0 15	16 1 16	(C10)-(000)	6	1276.62619	-568(1254)	0.1434(123)	0.1300	0.0874	
1 1 1	2 2 2	(C20)-(010)	6	1531.12878	-2536( 358)	0.4289(138)	0.4380	0.4584	0.5069
1 1 1	2 2 2	(C10)-(000)	7	1561.31034	-1649( 79)	0.4111( 18)	0.4380	0.4504	0.5069
1 1 1	2 2 2	(C10)-(000)	6	1564.07631	-2628( 224)	0.4634( 64)	0.4380	0.4594	0.5069
2 1 2	3 1 3	(610)-(000)	7	1536.80972	-1838(1232)	0.4677(140)	0.4670	0.5173	0.5663
2 1 2	3 1 3	(100)-IO10	6	2003.00020	3062( 864)	0.4870(165)	0.4670	0.5173	0.5663
3 1 3	4 1 4	(020)-(010)	6	1482.539.99	2711( 302)	0.4435(112)	0.4580	0.4014	0.5151
3 1 3	4 1 4	(010)-(000)	8	1511.02876	2120( 172)	0.4427( 64)	0.4580	0.4814	0.5151
3 1 3	4 1 4	(010)-(000)	7	1514.04494	1917( 447)	0.4379(154)	0.4580	0.4814	0.5151
3 1 3	4 1 4	(010)-(000)	6	1517.43097	2212( 121)	0.4345(191)	0.4580	0.4014	0.5151
4 1 4	5 1 5	(020)-(010)	6	1460.93771	1568( 361)	0.4396( 15)	0.4370	0.4845	0.5075
4 1 4	5 1 5	[010)-(000)	7	1492.96540	-37( 544)	0.4539( 60)	0.4370	0.4045	0.5075
4 1 4	5 1 5	(C10)-(000)	6	1496.24891	-19( 98)	0.4602(117)	0.4370	0.4045	0.5075
4 1 4	5 1 5	(100)-(010)	6	1956.80865	-1570( 314)	0.4425( 12)	0.4370	0.4845	0.5075
5 1 5	6 1 6	(020)-(010)	6	1440.69963	4183( 687)	0.3666( 73)	0.4000	0.4351	0.4667
5 1 5	6 1 6	(C10)-(000)	8	1470.00729	4040( 799)	0.3896( 16)	0.4000	0.4351	0.4667
5 1 5	6 1 6	(C10)-(000)	7	1472.93s58	3612( 629)	0.3726( 55)	0.4000	0.4351	0.4667
5 1 5	6 1 6	(010)-(000)	6	1476.13251	4036( 192)	0.3900(250)	0.4000	0.4351	0.4667
6 1 6	7 1 7	(020)-[010]	6	1421.21592	1148( 239)	0.3630( 30)	0.3630	0.3956	0.3967
6 1 6	7 1 7	(010)-(000)	8	1450.59911	832( 334)	0.3696( 16)	0.3630	0.3956	0.3967
6 1 6	7 1 7	(010)-(000)	7	1453.38420	1127( 516)	0.3519(131)	0.3630	0.3956	0.3967
6 1 6	7 1 7	(010)-(000)	6	1456.50977	2158( 164)	0.3600(200)	0.3630	0.3956	0.3967
7 1 7	8 1 8	(020)-(010)	6	1402.05545	374( 536)	0.3131( 77)	0.3180	0.3083	0.3432
7 1 7	8 1 8	(010)-(000)	8	1431.230.99	187( 335)	0.3199(148)	0.3180	0.3083	0.3432
7 1 7	8 1 8	{010)-(000)	7	1433.96171	-262( 323)	0.3221(108)	0.3160	0.3083	0.3432
7 1 7	8 1 8	{010)-(000)	6	1437.02622	-26( 451)	0.3303(188)	0.3180	0.3083	0.3432
8 1 8	9 1 9	IO20I-(010)	6	1382.97009	929( 695)	0.2772( 74)	0.2770	0.3641	0.2848
8 1 8	9 1 9	(010)-(000)	8	1411.80823	2030( 618)	0.2777(129)	0.2770	0.3641	0.2848
9 1 8	9 1 9	{010)-(000)	7	1414.48952	1884( 377)	0.2903(280)	0.2770	0.3641	0.2048
9 1 8	9 1 9	(010)-(000)	6	1417.49845	1660( 90)	0.2910(109)	0.2770	0.3641	0.2648
9 1 9	10 1 10	IO20I-[010]	6	1363.03407	3377( 79)	0.2447( 88)	0.2400	0.2168	0.2368
9 1 9	10 1 10	(010)-[000]	8	1392.2537s	5182( 385)	0.2201(161)	0.2400	0.2160	0.2368
9 1 9	10 1 10	C1 O	6	1397.84343	3927( 55)	0.2423( 45)	0.2400	0.2168	0.2368
10 1 1 0	1 1 1 6	{020)-(010)	6	1344.59245	-2513(3454)	0.2192( 27)	0.2130	0.1828	0.2046
10 1 1 0	1 1 1 11	(010)-(0001)	8	1372.53904	1492( 236)	0.2257( 40)	0.2130	0.1028	0.2046
10 1 1 0	1 1 1 C 1	(010)-(000)	6	1370.02963	500( 199)	0.2227( 50)	0.2130	0.1828	0.2046
11 1 1 11	12 0 12	{010)-(000}	6	1358.04907	1259( 194)	0.2138( 86)	0.1920	0.1707	0.0186
12 1 1 2 1	3 1 3 0 1 3	(010)-(000)	6	1337.90874	1820( 423)	0.1890( 53)	0.1700	0.1448	0.1511
13 1 1 3 1 4 0 1 4	(010)-(000)	6	1317.61569	410(25/24)	0.1823( 82)	0.1700	0.1110	0.0116	
14 1 1 4 1 5 0 1 s	(010)-(000)	6	1297.10381	-3533( 864)	0.1556( 32)	0.1480	0.0910		
16 1 1 6 1 7 0 1 7	(010)-(000)	6	1255.96155	-s182(1413)	0.1118( 92)	0.1200	0.0743		
1 1 0	2 1 2 1	(020)-(010)	6	1459.60771	-5606( 141)	0.4233( 22)	0.4050	0.5152	0.5256
1 1 0	2 1 2 1	{010)-(000)	8	1s00.15891	-2607( 56)	0.4800( 25)	0.4850	0.5152	0.5256
1 1 0	2 1 2 1	(010)-(000)	7	1502.72747	-2865( 280)	0.4872( 82)	0.4850	0.5152	0.5256
1 1 0	2 2 1 2	{010)-(000)	4	1505.60426	-4302( 686)	0.4800( 89)	0.4850	0.5152	0.5256
1 1 0	2 2 1 2	(100)-(010)	6	1956.18553	-2905( 864)	0.4480( 41)	0.4850	0. S152	0.5256
2 1 1	3 2 2 2	(020)-(010)	6	1441.5 S833	-4456( S98)	0.4400<119	0.4380	0.4602	0.4739
1 1 1	3 2 2 2	{010)-(000)	8	1481.97746	-3752( 325)	0.4158( 58)	0.4380	0.4602	0.4739
2 1 1	3 2 2 2	{010)-(000)	7	1484.51094	-3275(1022)	0.4180(125)	0.4380	0.4602	0.4739
2 1 1	3 2 2 2	{010)-(000)	6	1487.34856	-3905( 129)	0.4200(299)	0.4380	0.4602	0.4739
3 1 2	4 2 3	(020)-(010)	6	1426.61010	-1739( 127)	0.4688( 6)	0.4670	0.4839	0.5376
3 1 2	4 2 3	{010)-(000)	8	1466.77783	-265( 37)	0.4591( 33)	0.4670	0.4839	0.5376
3 1 2	4 2 3	{010)-(000)	7	1469.26527	-431( 653)	0.4539( 44)	0.4670	0.4839	0.5376
3 1 2	4 2 3	{010)-(000)	6	1472.05123	-1108( 181)	0.4488(430)	0.4670	0.4839	0.5376
3 1 2	4 2 3	{010)-(000)	6	1919.37628	471( 94)	0.4788(106)	0.4670	0.4839	0.5376
4 1 3	5 2 4	(020)-(010)	6	1414.42220	-947( 512)	0.4612( 63)	0.4620	0.4949	0.5355
4 1 3	5 2 4	{010)-(000)	8	1454.00566	-49( 438)	0.4614( 45)	0.4620	0.4949	0.5355
4 1 3	5 2 4	{010)-(000)	6	1459.26905	-368( 414)	0.4706(295)	0.4620	0.4949	0.5355
5 1 4	6 2 5	(020)-(010)	6	1404 .16882	-2054( 324)	0.4305( 88)	0.4400	0.4807	0.5202
5 1 4	6 2 5	{010)-(000)	8	1442.82604	-145( 184)	0.4518( 16)	0.4400	0.4807	0.5202
5 1 4	6 2 5	{010)-(000)	7	1445.24439	-392(1356)	0.4525( 91)	0.4400	0.4807	0.5202
5 1 4	6 2 5	{010)-(000)	6	1447 .9516s	-736( 106)	0.4500(250)	0.4400	0.4807	0.5202
6 1 5	7 2 6	{010)-(000)	8	1431.49076	129( 437)	0.3854(219)	0.4030	0.4415	0.4727
6 1 5	7 2 6	{010)-(000)	7	1433.92018	146s( 658)	0.3860(109)	0.4030	0.4415	0.4727
6 1 5	7 2 6	{010)-(000)	6	1436.65552	5( 495)	0.4045( 67)	0.4030	0.4415	0.4727
7 1 6	8 2 7	(020)-(010)	6	1284.17032	362( 820)	0.3422( 80)	0.3500	0.3965	0.3903
7 1 6	8 2 7	{010)-(000)	7	1421.34723	-1727( 345)	0.3402( 80)	0.3500	0.3965	0.3903
7 1 6	8 2 7	{010)-(000)	6	1424.13000	-1965( 115)	0.3564( 20)	0.3800	0.3965	0.3903
6 1 7	9 2 8	{010)-(000)	6	1409.96864	-470( 46)	0.3206( 47)	0.3130	0.3619	0.3610
9 1 8	1 0 2 9	[020)-(010)	6	1350.72202	-2355( 314)	0.2379( 57)	0.2570	0.2698	0.2790
9 1 0 1 0 1 2 9	{010)-(000)	8	1389.01606	-236( 550)	0.2409( 30)	0.2570	0.2698	0.2790	
1 0 1 9 1 1 2 1 1	(010)-(000)	6	1378.01007	-1646( 253)	0.2377(154)	0.2130	0.2193	0.2362	
1 1 1 1 0 1 2 2 1 1	{010)-(000)	6	1361.01365	-2( 498)	0.1914(178)	0.1920	0.1834	0.1969	
12 1 1 1 13 2 12	{010)-(000)	6	1343.67833	-84( 173)	0.1686( 55)	0.1680	0.1424	0.1520	
1 3 1 1 2 1 4 2 1 3	{010)-(0001)	6	1326.13483	240( 150)	0.1532( 20)	0.1520	0.1203	0.1255	
15 1 1 14 16 2 15	{010)-(000)	6	1290.71602	-2984( 472)	0.1301( 75)	0.1300	0.0847		
1 1 1 1 2 2 0	{020)-(010)	6	1452.60700	44( 67S)	0.4153( 38)	0.4500	0.5242	0.5072	
1 1 1 1 2 2 0	{010)-(000)	8	1493.27695	-1008( 247)	0.4575( 32)	0.4500	0.5242	0.5072	
1 1 1 1 2 2 0	{010)-(000)	7	1495.08383	-641( 929)	0.5016(2571)	0.4500	0.5242	0.5072	
1 1 1 1 2 2 0	{010)-(000)	6	1490.80321	-1053(1324)	0.4600(200)	0.4500	0.5242	0.5072	
2 1 2 1 3 2 1	(020)-(010)	6	1418.58210	-986( 314)	0.4495( 64)	0.4600	0.5055	0.5262	
2 1 2 1 3 2 1	{010)-(000)	7	1461.91156	-234( 686)	0.4666( 92)	0.4600	0.5055	0.5262	
2 1 2 1 3 2 1	{010)-(000)	6	1464.90510	-858( 215)	0.4672(219)	0.4600	0.5055	0.5262	
3 1 3 4 2 2	{020)-(010)	6	1377.00997	79( 79)	0.4327( 61)	0.4220	0.4440	0.4955	
3 1 3 4 2 2	{010)-(000)	8	1417.80331	2616( 782)	0.4260(109)	0.4220	0.4440	0.4955	
3 1 3 4 2 2	{010)-(000)	7	1420.58716	1806( 393)	0.4261( 73)	0.4220	0.4440	0.4955	
3 1 3 4 2 2	{010)-(000)	6	1423.70419	2040( 72)	0.4261( 22)	0.4220	0.4440	0.4955	
4 1 4 5 2 3	{020)-(010)	6	1327.73552	2341( 130)	0.4716( 35)	0.4600	0.4706	0.5214	
4 1 4 5 2 3	{010)-(000)	8	1360.92858	1777(1224)	0				

table 2. continued

upper J KA KC	lower J KA KC	band	mol	frequency (computed)	shift (obs.)	wl dth. (ohs.)	smoothed	WITRAN	BK
6 1 6	7 2 5	(020)-(010)	6	1209 .2662S	-471( 157)	0.4271( 92)	0.4180	0.4554	0.4889
6 1 6	7 2 5	(010)-(000)	8	1253.92405	<b>1832</b> ( 267)	0.4201( 27)	0.4180	0.4554	<b>0.4889</b>
6 1 6	7 2 5	(010)-(000)	6	1260,34340	1333( 251)	0.4362( 77)	<b>0.4180</b>	0.4ss.4	<b>0.4889</b>
7 1 7	8 2 6	(010)-(000)	6	1198.17837	-237( 96)	0.4108( 20)	0.4080	0.4417	0.4412
8 1 6	9 1 7	(010)-(000)	6	1135.74528	2686( 449)	0.3588( 82)	0.3600	0.3707	0.387s
9 1 9	10 2 8	(010)-(000)	6	1074.40708	2198( 471)	0.3178( 64)	0.3110	0.3352	0.3394
10 1 10	11 2 9	(010)-(000)	6	1014,47s21	-262( 392)	0.2744( 35)	0.2720	0.246S	0.263S
11 1 11	12 2 10	(010)-(000)	6	95 S.68698	-471( 314)	0.2406( 5)	0.2400	0.199s	0.2224
12 1 12	13 2 11	(010)-(000)	6	897.69403	-707( 550)	0.2121(140)	0.2400	<b>0.1842</b>	<b>0.1943</b>
2 2 2	C 3 3 1	(030)-(010)	4	1409.75920	-2595( <b>181</b> )	0.4040( 6)	0.4200	0.4707	0.4601
2 2 2	C 3 3 1	(010)-(000)	8	1453.34316	<b>-825</b> ( 52)	0.4128( 5)	0.4200	0.4707	0.4601
2 2 2	C 3 3 1	(010)-(000)	7	1455.66682	-620( 200)	0.4150(210)	0.4200	0.4707	0.4603
2 2 2	C 3 3 1	(010)-(000)	6	1458.26700	367( 749)	0.4177(196)	0.4200	0.4707	0.4601
3 2 1	4 3 2	(020)-(010)	6	1387.93362	-1479( 460)	0.4329( 11)	0.4380	0.4654	0.47s3
4 2 2	5 3 3	(020)-(010)	6	1369.53145	-4425( 434)	0.4285( 35)	0.4240	0.5197	0.4761
4 2 2	5 3 3	(010)-(0001)	8	1414.20464	-1846( 601)	0.43 S1(200)	0.4240	0.s197	0.4761
4 2 2	5 3 3	(010)-(000)	7	1416.47808	314( 63)	0.4199( 73)	0.4240	0.s197	0.4763
4 2 2	5 3 3	(010)-(0001)	6	1418.93297	-390( 201)	0.4291( 80)	0.4240	0.5197	0.4761
S 2 3	6 3 4	(020)-(010)	6	1355.2099s	-3361(1042)	0.4255( [12]	0.4380	0.4335	0.4971
5 2 3	6 3 4	(010)-(000)	8	1400.54004	-2,299( 190)	0.4471I( 53)	0.4380	0.4335	0.4971
S 2 3	6 3 4	1010)-(000)	7	3402.63992	236( 79)	0.4332( 57)	0.4380	0.433s	0.4971
6 2 4	7 3 5	(020)-(010)	6	1344.72465	-1518( 412)	0.4212( 40)	0.4220	0.4502	0.4921
6 2 4	7 3 5	(010)-(000)	8	1390.23099	-471( 513)	0.3962( 47)	0.4220	0.4s02	0.4921
7 2 s	8 3 6	(020)-(010)	6	1337. <b>29581</b>	0( 128)	0.4098( 70)	0.3850	0.4593	0.4614
7 2 5	8 3 6	[010)-(000)	6	1386.47661	-1406( 147)	0.3616{ ( 51)	0.3850	0.4593	0.4614
9 2 7	1 0 3 8	(010)-(000)	6	3372.26982	-223( 60)	0.3692(117)	0.3500	0.3971	0.3924
1 1 2 9	12 3 10	(010)-(0001)	6	1352.34872	-649( 158)	0.2s12( 3s)	0.2s20	0.2482	0.2609
12 2 10	13 3 11	(010)-(000)	6	1339.60221	-1739(1088)	0.2060( 33)	0.2100	0.2119	0.220s
13 2 11	14 3 12	(010)-(000)	6	1325.60507	1008(1814)	0.1984(189)	0.3920	0.1858	<b>0.1883</b>
2 2 1	3 3 0	{020)-(010)	6	1408.52958	-1003( 183)	0.3711( 12)	0.4330	0.4616	0.5075
2 2 1	3 3 0	(030)-(000)	8	1451.91143	<b>708</b> ( 178)	0.4291( 10)	0.4330	0.4616	0.s07s
2 2 1	3 3 0	(010)-(000)	7	1454.25978	<b>1045</b> ( 332)	0.4292( 73)	0.4330	0.4616	0.507s
2 2 1	3 3 0	(010)-(000)	6	1456.88705	-991( 345)	0.4277(219)	0.4330	0.4616	0.507s
3 2 2	4 3 1	(020)-(010)	6	1381.76361	-2399( 522)	0.3776( 74)	0.4030	0.4s33	0.4462
3 2 2	4 3 1	(010)-(000)	8	1424.01419	-3453( <b>92</b> )	0.3970( 54)	0.4030	0.4533	0.4462
3 2 2	4 3 1	(0103)-(000)	7	1427.26808	-2434( 393)	0.3009( <b>41</b> )	0.4030	0.4533	<b>0.4462</b>
3 2 2	4 3 1	(010)-(000)	6	1429.94505	-2745( 194)	0.3910(120)	0.4030	0.4s33	0.4462
4 2 3	5 3 2	{0201)-(010)	6	1351.57016	-1304( 653)	0.4017( 16)	0.4180	0.4723	0.49s4
4 2 3	5 3 2	(010)-(000)	8	1393.88010	-2610( 232)	0.4329( 30)	0.4180	0.4723	0.4954
4 2 3	5 3 2	(010)-(000)	7	1396.39468	-2787( 492)	0.4157(146)	0.4180	0.4723	0.4954
5 2 4	6 3 3	(010)-(000)	8	1356.84366	1492( 79)	0.4381( <b>83</b> )	0.4230	0.4905	<b>0.5168</b>
5 2 4	6 3 3	(010)-(000)	6	1362.60374	1751( 139)	0.4387( 25)	0.4230	0.4905	0.5168
6 2 5	7 3 4	(010)-(000)	8	1312.63258	628( 126)	0.3936(117)	0.4130	0.4842	0.5172
6 2 5	7 3 4	{010)-(000)	7	131 S.60655	550( 79)	0.4277( <b>51</b> )	0.4130	0.4042	0.5172
6 2 5	7 3 4	(010)-(000)	6	1318.92943	1437( <b>189</b> )	0.4262( 43)	0.4130	0.4042	0.5172
7 2 4	8 3 5	(010)-(000)	8	1261.57741	942( 188)	0.3S76( 22)	0.3810	<b>0.4288</b>	0.4509
7 2 6	8 3 5	(030)-(000)	6	1268.38224	3279( S131)	0.4046(119)	0.3810	<b>0.4288</b>	0.4509
8 2 7	9 3 6	(010)-(000)	6	1212.24673	<b>1558</b> ( 316)	0.3682(1093)	0.3520	0.4170	0.4311
9 2 8	1 0 3 7	(010)-(000)	6	1152.44419	-1044(1485)	0.3741(151)	0.3700	0.4107	0.4182
1 0 2 9	1 1 3 8	(010)-(0001)	6	1091.20494	1413( 1571)	0.3447( <b>51</b> )	0.3410	0.3672	0.3751
11 2 10	1 2 3 9	(010)-(000)	6	1030. S44S7	<b>2512</b> ( 1s7)	0.3044( 74)	0.3040	<b>0.3201</b>	0.3273
12 2 31	13 3 10	(010)-(000)	6	971.6S607	236( S50)	0.2582( 33)	0.2s80	<b>0.2425</b>	0.2530
3 3 0	4 4 1	(020)-(010)	6	1371.03947	238b( <b>185</b> )	0.2957( <b>38</b> )	0.3400	0.3760	0.4098
3 3 0	4 4 1	(030)-(000)	8	1414.98367	1778( 30)	0.3424( 15)	0.3400	0.3760	0.4098
3 3 0	4 4 1	(010)-(000)	7	1417.11992	<b>1887</b> ( 186)	0.3431( <b>89</b> )	0.3400	0.3760	0.4098
3 3 0	4 4 1	(010)-(000)	6	1419.50798	1747( 268)	0.3514(2631)	0.3400	0.3760	0.4098
4 3 1	5 4 2	(020)-(010)	6	1347.03163	2555( 700)	0.3250(146)	0.3s00	0.3692	0.4079
4 3 1	5 4 2	(010)-(000)	8	1391.32591	-717( 269)	0.3517( <b>83</b> )	0.3500	0.3692	0.4079
4 3 1	5 4 2	(010)-(000)	7	1393.43949	-393( 393)	0.3434( 75)	0.3500	0.3692	0.4079
4 3 1	5 4 2	(010)-(000)	6	1395.80257	-953( 133)	0.3487(275)	0.3s00	0.3692	0.4079
5 3 2	6 4 3	(020)-(010)	6	1324.34949	626( 620)	0.3436( <b>58</b> )	0.3600	0.3899	0.44ss
5 3 2	6 4 3	(010)-(000)	8	1369.43164	-787( 255)	<b>0.3681</b> ( 3S)	0.3600	0.3899	0.44ss
5 3 2	6 4 3	(010)-(000)	7	1371.47373	1335( 236)	0.3583(105)	0.3600	0.3899	0.4455
S 3 2	6 4 3	(010)-(000)	6	1373.76945	-426( 111)	0.3475(263)	0.3600	0.3899	0.445s
6 3 3	7 4 4	{020)-(010)	6	1304.28570	-890( 148)	0.3642( 23)	0.3680	0.4123	0.4s43
6 3 3	7 4 4	(010)-(000)	8	1350.75024	-1963( 550)	0.3593( 89)	0.3680	0.4123	0.4543
6 3 3	7 4 4	(010)-(000)	7	1352.68246	-2669( 471)	0.3570( 27)	0.3680	0.4123	0.4s43
6 3 3	7 4 4	(010)-(000)	6	13 8.84566	-2050( 240)	<b>0.3808</b> ( <b>74</b> )	0.3680	0.4123	0.4543
7 3 4	8 4 5	S (010)-(000)	8	1336.42140	-2434( 236)	0.3604( 61)	0.3740	0.4s90	0.46ss
7 3 4	8 4 5	(010)-(000)	6	1340.16675	-2683( 121)	0.3094{ ( 77)	0.3740	0.4590	0.4655
8 3 5	9 4 6	(010)-(000)	6	1329.90473	-1190( 347)	0.4049( 50)	0.3930	0.4300	0.4515
9 3 6	1 0 4 7	(010)-(000)	6	1323.33440	-1420( 192)	0.4020( 70)	0.4000	0.4320	0.4447
1 0 3 7	1 1 4 0	(010)-(000)	6	1319.22927	1259( 478)	0.3820( 61)	0.3870	0.4280	0.4229
1 2 3 9	1 3 4 1 0	(010)-(000)	6	1312.3467S	-2120( <b>79</b> )	0.3013( 2)	0.3000	<b>0.3204</b>	0.3304
1 3 3 1 0	1 4 4 1 1	(010)-(000)	6	1306.78749	-2669( 314)	0.2565( <b>32</b> )	0.2500	0.2490	0.2589
3 3 1	4 4 0	{030)-(010)	6	1370.89240	2093( 106)	0.2796( 37)	0.3500	0.3989	0.4160
3 3 1	4 4 0	(010)-(000)	8	1414.78020	2570( 192)	0.3429( 67)	0.3500	0.3989	0.4160
3 3 1	4 4 0	(010)-(000)	7	1416.92251	3040{ ( 3291)	0.3409( 64)	0.3500	0.3989	0.4160
4 3 2	5 4 1	(020)-(010)	6	1346.00353	2338( 202)	0.3072( <b>80</b> )	0.3s10	0.3763	0.4109
4 3 2	5 4 1	(010)-(000)	8	1389.91037	1306( <b>151</b> )	0.3431( <b>32</b> )	0.3510	0.3763	0.4109
4 3 2	5 4 1	(010)-(000)	7	1392.06589	1022( 448)	0.3397(159)	0.3510	0.3763	0.4109
5 3 3	6 4 2	[010)-(000)	8	1363.95106	<b>-190(1061)</b>	0.3s00( 228)	0.3600	0.4046	0.4249
5 3 3	6 4 2	(010)-(000)	7	1366.16059	-157( 444)	0.3637(143)	0.3600	0.4046	0.4249
5 3 3	6 4 2	(010)-(000)	6	1368.62749	-824( <b>81</b> )	0.3617( 20)	0.3600	0.4046	0.4249
6 3 4	7 4 3	{020)-(010)	6	1292.82692	-4345( 267)	0.3225( 82)	0.3670	0.4203	0.4414
6 3 4	7 4 3	(010)-(000)	8	1335.51770	779( <b>437</b> )	0.3497( 74)	0.3670	0.4203	<b>0.4414</b>
6 3 4	7 4 3	(010)-(000)	7	1337.86200	-393(1021)	0.3420( 51)	0.3670	0.4203	0.4414
6 3 4	7 4 3	{0101)-(0001)	6	1340.47s30	-899( <b>51</b> )	0.3536( 27)	0.3670	0.4203	0.4414
7 3 5	8 4 4	(010)-(000)	8	1302.69588	-1178( 236)	0.3735( <b>8</b> )	0.3750	0.4099	0.4256
7 3 5	8 4 4	(010)-(000)	6	1300.17887	-8( 5s)	0.3869( 75)	0.3750	0.4099	

table 2. continued

<b>upper J KA KC</b>	<b>lower J KA KC</b>	<b>band</b>	<b>frequency (computed)</b>	<b>shift (ohm.)</b>	<b>width (obs.)</b>	<b>bandwidth MHz</b>	<b>intensity</b>	<b>ER</b>
<b>6 4 2</b>	<b>7 s 3</b>	(010)-(000)	<b>8</b>	133s.37s57	2434( 79)	0.2847( 71)	0.2800	0.3696 0.3890
6 4 2	7 s 3	(010)-(000)	7	133.33269	2434( 236)	0.2733( 33)	0.2880	0.3696 0.3890
<b>6 4 2</b>	<b>7 s 3</b>	<b>(010)-(000)</b>	6	1339. s1680	1673( 136)	0.2931( 51)	<b>0.2880</b>	0.3696 0.3890
<b>7 4 3</b>	<b>8 5 4</b>	(010)-(000)	<b>8</b>	1312.94534	3455( 31s)	0.3209( 67)	0.3130	<b>0.4098</b> 0.4027
7 4 3	<b>8 5 4</b>	(010)-(000)	6	1316.97241	<b>2788( 83)</b>	0.3270( 32)	0.3130	<b>0.4098</b> 0.4027
8 4 4	9 s s	(0101)-(000)	6	1296.70936	1867( 176)	0.3691( <b>83</b> )	0.3450	0.3962 0.4101
9 4 s	1 0 s 6	(010)-(000)	6	1280.04757	-629( 319)	0.3677(117)	0.3700	0.40s3 0.4187
<b>10 4 6</b>	<b>11 5 7</b>	(010)-(000)	6	1267. 9s311	-12. S9(1113)	0.3922( 70)	0.3900	0.4043 0.4208
1 1 4 7	1 2 s 8	(010)-(0001)	6	1260.49761	-1199( 814)	0.4098(117)	0.4000	0.4436 0.4382
<b>12 4 8</b>	1 3 s 9	(010)-(000)	6	12. S6.88062	1806( 550)	0.3s2s( 54)	0.3600	0.4101
<b>4 4 1</b>	<b>5 5 0</b>	(020)-IO10	6	1340.619s3	1400( 683)	0.2531(231)	0.2700	0.2961 0.3166
<b>4 4 1</b>	S s o	(010)-(000)	<b>8</b>	138s.32s39	1791( 6s)	0.2877( 4S)	0.2700	0.2961 0.3166
4 4 1	S s o	(010)-(000)	7	138. S.30822	1052(1064)	0.2739(112)	0.2700	0.2961 0.3166
<b>5 4 2</b>	<b>6 5 1</b>	[010)-(000)	8	1358.86032	1952( 309)	0.2 S97(187)	0.2710	0.3230 0.3424
6 4 3	7 s 2	(010)-(0001)	<b>8</b>	1334.31031	1470( 350)	0.2719( 89)	0.2720	0.3372 0.3623
6 4 3	7 5 2	(010)-(0001)	7	1336.31209	864( 393)	0.2673( 13)	0.2720	0.3372 0.3623
6 4 3	7 S 2	(010)-(000)	6	1338.54602	862( 74)	0.2684( 30)	0.2720	0.3372 0.3623
7 4 6	<b>8 5 3</b>	(010)-(000)	8	1309.25601	-133s.236	0.2795( 30)	0.2850	0.3530 <b>0.3588</b>
7 4 4	<b>8 5 3</b>	(010)-(000)	6	1313. S.9639	-1609( 60)	0.2919( 71)	0.2880	0.3s30 <b>0.3588</b>
<b>6 4 5</b>	9 s 4	(010)-(000)	8	1282.80633	-1963( 79)	0.3017( 41)	0.3120	0.33s9 0.3546
<b>8 4 5</b>	9 5 4	(0101)-(000)	6	1287.40009	-1872( 107)	0.3103( 40)	0.3120	0.33s9 0.3546
9 4 6	1 0 5 5	(C10)-IOOO	6	12. S8.61762	-2114( 297)	0.3 S18( <b>40</b> )	0.3s20	<b>0.3842</b> 0.3872
<b>10 4 7</b>	1 1 s 6	(010)-(000)	6	122. S. Ss124	-924( 66s)	0.3880( 44)	0.3810	0.4113 0.4116
<b>5 5 0</b>	<b>6 6 1</b>	(020)-(010)	6	1316. S5003	-2500(2000)	<b>0.1840(140)</b>	0.2130	0.2187
<b>5 5 0</b>	<b>6 6 1</b>	(010)-(000)	<b>8</b>	1357.16194	-2041( 314)	0.2066( 68)	0.2130	0.2187
6 S 1	7 6 2	(010)-(000)	6	1336.68993	1563( 1S3)	0.2228( 73)	0.2200	0.2s47
<b>7 5 2</b>	<b>8 6 3</b>	(010)-(000)	8	1308.63417	1870( 587)	0.2267( 97)	0.2400	0.3064
<b>7 5 2</b>	8 6 3	(010)-(000)	6	1312. SSS68	<b>1894( 144)</b>	0.2401( 48)	0.2400	0.3064
<b>8 5 3</b>	9 6 4	(0101)-(0001)	6	1288.88656	1110( 268)	0.2827( 84)	0.2s20	0.3259
9 5 4	1 0 6 s	(010)-(0001)	6	1266.07294	1981( 378)	0.2660(111)	0.2620	0.3267
<b>10 5 5</b>	<b>11 6 6</b>	(010)-(000)	6	1244.80298	1636( 166)	0.3090( 77)	0.3020	<b>0.3487</b>
11 5 6	1 2 6 7	(010)-(000)	6	1226.10364	-110( S10)	0.3214(199)	0.3270	0.3846
<b>5 5 1</b>	6 6 0	(010)-(000)	8	1357.15902	<b>4477( 391)</b>	0.21s3( 16)	0.2020	<b>0.2188</b> 0.2269
6 5 2	7 6 1	(010)-(000)	8	1332.73471	999(1017)	0.2019( 87)	0.2100	0.2531 <b>0.2682</b>
6 5 2	7 6 1	(010)-(0001)	6	1336.66276	<b>885( 188)</b>	0.2172( 1s)	0.2100	0.2831 0.2682
7 s 3	<b>8 6 2</b>	(010)-(000)	6	1312. 399s6	1074( 139)	0.2267( 63)	0.2200	0.3033 0.29s9
<b>8 5 4</b>	9 6 3	(010)-(000)	6	1288.24994	<b>-467( 117)</b>	0.2327( 70)	0.2380	0.3233 0.3134
9 S S	1 0 6 4	IO10)-(IO001)	6	1264.01395	-6s9( 237)	0.2600( 61)	0.2s70	0.3289 0.3204
1 0 S 6	1 1 6 5	(010)-(000)	6	1239.21916	-1415( 73s)	0.2827( 22)	0.2740	0.3249 0.3278
<b>11 5 7</b>	<b>12 6 6</b>	(010)-(000)	6	1213.00712	-2198( 678)	0.2893( <b>38</b> )	0.2930	<b>0.2991</b> 0.31s7
12 S 8	1 3 6 7	(010)-(000)	6	1184. 1042s	-2748( 79)	0.3064( 32)	0.3020	0.3326 0.3293
<b>8 6 2</b>	9 7 3	(010)-(000)	6	1290.55893	369( 160)	0.1931( 30)	<b>0.1980</b>	0.2343 0.0232
9 6 3	1 0 7 4	(010)-(000)	6	1266.66806	-6s1( 144)	0.2050( 33)	0.2060	0.2700 0.2631
1 0 6 4	1 1 7 S	(010)-(000)	6	1243.190s4	-579(1657)	0.2176( 97)	0.2120	<b>0.2813</b> 0.273s
1 1 6 5	1 2 7 6	(010)-(000)	6	1220.34464	403(129s)	0.2307(106)	0.2330	0.3000 0.2987
6 6 3	7 7 7 0	(020)-(010)	6	1297.13464	-628( 157)	0.162s( 97)	0.1s80	0.1498 0.1631
4 6 1	7 7 0	(010)-(000)	<b>8</b>	13s.45793	-695( 193)	0.1360(126)	0.15s0	<b>0.1498</b> 0.1631
6 6 1	7 7 0	(010)-(000)	7	1337.20334	-1099( 314)	0.1434( 51)	0.1s50	0.1498 0.1631
6 6 1	7 7 0	(010)-(000)	6	1339.1408s	253( 73)	0.1510( 41)	0.1s80	<b>0.1498</b> 0.1631
<b>8 6 3</b>	<b>9 7 2</b>	(010)-(000)	6	1290.53584	-118( 86)	<b>0.1820( 58)</b>	0.1800	0.2312 0.2322
<b>9 6 4</b>	<b>10 7 3</b>	(010)-(000)	6	1366.56110	<b>-642( 358)</b>	0.1995( 37)	0.2000	<b>0.2625</b> <b>0.2500</b>
1 0 6 S	<b>11 7 4</b>	(010)-(000)	6	1243.79930	-1334( 296)	0.2181( 86)	0.2130	0.2661 0.2712
1 1 6 6	1 2 7 S	(010)-(000)	6	1219.14723	-3298( 472)	0.2321( <b>8</b> )	0.2320	0.2862 0.2816
1 2 6 7	1 3 7 6	(010)-(000)	6	1195.34396	-2891( 5s0)	0.2421( 16)	<b>0.2420</b>	0.2646 0.2762
7 7 0	<b>8 8 1</b>	[010)-(000)	<b>8</b>	1317.36671	-2041( 471)	0.1180( <b>82</b> )	0.1380	<b>0.1240</b> 0.1290
1 0 7 3	1 1 8 4	(010)-(000)	6	1248.46317	-2355( 222)	0.2078( 20)	0.2070	0.2356 0.0231
1 1 7 4	1 2 8 S	(010)-(000)	6	<b>1224.89123</b>	-1832( 534)	0.2058( 77)	0.2170	0.2332 0.2419
7 7 1	<b>8 8 0</b>	(010)-(000)	6	1320.86865	145( S5)	0.1321( 23)	0.1s80	0.1498 0.1631
<b>8 7 2</b>	9 8 1	(010)-(000)	6	1296.49010	<b>275( 128)</b>	0.1607( 16)	0.1570	0.1692 0.1726
9 7 3	1 0 8 2	(010)-(000)	6	1272.34049	3491(3491)	0.1965( 2)	0.1900	0.194s 0.0200
1 0 7 4	1 1 8 3	(010)-(000)	6	1348.44622	-1413( 931)	0.2023( 77)	0.2020	0.2346 0.2305
11 7 5	<b>12 8 4</b>	(010)-(000)	6	1224.82284	-1963( 79)	0.1952( 92)	0.2000	0.2279 0.0241
<b>8 8 1</b>	9 9 0	(010)-(000)	6	1305.48833	<b>-744( 113)</b>	0.1189( 17)	0.1380	0.1028 0.1080
9 8 2	1 0 9 1	(0101)-(0001)	6	1201.16097	441( 40)	0.1445( 27)	0.1s00	0.1472 0.1s06
10 8 3	1 1 9 2	(010)-(000)	6	12 S7.08748	-699( 747)	0.1615( S7)	0.1600	0.1676 0.1730
9 9 0 1	0 1 0 1	(010)-(000)	6	1292.37173	-78s( 222)	0.1141( 27)	0.1130	0.0925 0.0948
1 0 9 2	1 1 1 0 1	(010)-(000)	6	1268.11483	-2983( 128)	<b>0.1278( e3)</b>	0.1450	0.1239 <b>0.1274</b>
2 0 2	3 3 1	(010)-(000)	6	1379.74522	-871( 62)	0.43s9( 47)	0.4180	0.4250 0.46s1
3 0 3	4 3 2	[010)-(000)	<b>8</b>	134 S.71527	-393( 393)	0.4311( 531)	0.4490	0.4927 0.5193
3 0 3	4 3 2	(010)-(000)	6	1349.37981	-88s( 110)	0.4784(137)	0.4490	0.4927 0.5193
4 0 4	S 3 3	(010)-(000)	<b>8</b>	1309.591s0	-1s70( <b>628</b> )	0.3904( 20)	0.4200	0.4292 0.4806
<b>4 0 4</b>	5 3 3	(010)-(000)	6	1313.48305	-16ss( 2s2)	<b>0.4262( 83)</b>	0.4200	0.4292 0.4806
S o s	6 3 4	(020)-(010)	6	1207.27418	-2777( 393)	0.3773( 4s)	0.3900	0.4s81 0.4725
S o s	6 3 4	(010)-(000)	6	1271. 7s702	<b>-1338( 89)</b>	0.4234(120)	0.3900	0.4s81 0.4725
6 0 6	7 3 s	(010)-(000)	6	122 S. 00621	-4941( 368)	0.3675( <b>73</b> )	0.3600	0.3901 0.4299
7 0 7	<b>8 3 6</b>	(010)-(000)	6	1174 .82694	<b>-1821( 336)</b>	0.3586(117)	0.3300	0.3783 0.3817
8 0 8	9 3 7	(010)-(000)	6	1121. 23198	-701(1430)	0.3619( <b>189</b> )	0.2980	0.352s 0.3s43
1 0 0 1	0 1 1 3 9	(010)-(000)	6	1010.02022	-1963( 79)	0.2 S60(100)	0.2370	0.2474 0.2566
1 1 0 1 1 2 3 1 0		(010)-(000)	6	953.36742	314( 128)	0.2355( 95)	0.2220	0.2015 0.2176
<b>3 1 2</b>	<b>4 4 1</b>	(010)-(000)	6	1204.30574	-s982( 161)	0.4344( 60)	0.4320	0.446s 0.4643
4 1 1 3	S 4 2	(010)-(000)	6	126 S.35522	-2s96( 132)	0.4312( 41)	0.4280	0.427s 0.4756
<b>5 1 4</b>	6 4 3	(010)-(000)	<b>8</b>	1242.24380	707( 236)	0.4232( 16)	0.4120	0.4380 0.4714
5 1 4	6 4 3	(0101)-(000)	6	1244.13818	-1s54( 256)	0.4231(132)	0.4120	<b>0.4380</b> 0.4714
6 1 5	7 4 4	(010)-(000)	6	1218. S1976	-2s92( 82)	<b>0.3862( 33)</b>	0.3900	0.4212 0.4545
7 1 6	8 4 5	(010)-(0001)	6	1107.02167	-2494( 6s1)	0.3733(100)	0.3700	0.4045 0.4023
8 1 7	9 4 6	(010)-(000)	6	1149.46916	-2177( 976)	0.3646( 27)	0.3800	0.3936 0.3940
10 1 9 1 1 4 8		(010)-(000)	6	1060.11639	-1675( 296)	0.3029(111)	0.2900	0.2975 0.3050
<b>11 1 0 1 1 2 4 9</b>		(010)-(000)	6	1010.01329	-1204( <b>148</b> )	0.2700( <b>77</b> )	0.2700	<b>0.2589</b> 0.2672
3 1 3	4 4 0	(010)-(000)	6	12 S1.34950	-6281( 471)	0.4193( 99)	0.4280	<b>0.4389</b> 0.4443
<b>4 1 4</b>	<b>5 4 1</b>	(010)-(000)	6	1111.25554	-4197( 352)	0.4367( <b>55</b> )	0.4210	<b>0.4291</b> 0.4638
5 1 5	<b>6 4 2</b>	(010)-(000)	6	1165.04081	-s804( <b>838</b> )	0.4028( 3s)	0.4120	<b>0.4228</b> 0.4390
6 1 6	7 4							

table 2. continued

<b>upper</b>	<b>lower</b>	<b>J KA KC</b>	<b>J KA KC</b>	<b>band</b>	<b>mol.</b>	<b>frequency</b>	<b>shift</b>	<b>width</b>				
						(computed)	(ohm.)	(obs.)	smoothed	E ITRAN	BK	
<b>9 2 7</b>	<b>10 5 6</b>	<b>(010)-(000)</b>			6	1099.67929	-850( 79)	0.344S( 92)	0.3480	0.3879	0.3926	
<b>10 2 8</b>	<b>11 5 7</b>	<b>(010)-(000)</b>			6	1072.61356	-4502( 4s0)	0.31S3( 64)	0.3110	0.3376	0.3s03	
1 1 2 9	<b>12 5 8</b>	<b>(010)-(000)</b>			6	1039.48273	-3769( 801)	0.3191( 12)	0.2900	0.3080	0.3043	
4 2 3	<b>5 5 0</b>	<b>(010)-(000)</b>			6	1165.93998	-56S3( 471)	0.37ss( 30)	0.3620	<b>0.4291</b>	0.4164	
<b>5 2 4</b>	<b>6 5 1</b>	<b>(010)-(000)</b>			6	1135. S1996	-3926( 785)	0.3644( 35)	0.3500	0.4228	0.4218	
<b>6 2 5</b>	<b>7 5 2</b>	<b>[010]-[000]</b>			6	1101.4s0s4	-3140( 129)	0.3262(179)	0.3400	0.3841	0.4209	
<b>7 2 6</b>	<b>8 5 3</b>	<b>(010)-(000)</b>			6	1062.62031	-1S18( 196)	0.3 S06(106)	0.33s0	0.3283	0.3747	
<b>8 2 7</b>	<b>9 5 4</b>	<b>(010)-(000)</b>			6	1037.86848	-1099( 339)	0.3364(1031)	0.3100	0.3009	0.3571	
6 3 3	7 6 2	<b>(010)-(000)</b>			6	1066.39973	-2434( 393)	0.3s33( 20)	<b>0.3680</b>	0.3693	0.4067	
7 3 4	<b>8 6 3</b>	<b>(010)-(000)</b>			6	1051.26383	-s339( 339)	0.3s91( 80)	0.3050	0.4205	0.4239	
<b>8 3 5</b>	9 6 4	<b>(010)-(000)</b>			6	1039. s4411	<b>-2120( 79)</b>	0.395 s(177)	0.3800	0.3912	0.4091	
9 3 6	1 0 6 5	<b>(010)-(000)</b>			6	1029.6973S	-1727( 314)	0.3974( 2)	0.3s80	0.3947	0.4077	
6 3 4	7 6 1	<b>(010)-(000)</b>			6	1055.51773	-2041( 408)	0.3066(151)	0.3400	<b>0.3841</b>	0.3866	
7 3 5	<b>8 6 2</b>	<b>(010)-(000)</b>			6	1028.31249	-1492( 79)	0.33s6( 2s)	0.3220	0.3283	0.3s88	
6 3 6	9 f 3	<b>(010)-(000)</b>			6	998.80957	-1884( 157)	0.3187( 32)	0.3170	0.3009	0.34s8	
1 0 1	<b>1 1 0</b>	<b>{0201)-(010)</b>			6	1534. 93s44	5472( 279)	0.4413( 32)	0.4630	0.4927	<b>0.4889</b>	
1 0 1	<b>1 1 0</b>	<b>(010)-(0001)</b>		<b>8</b>	6	1570.02288	3420( 2S4)	0.4604( 88)	0.4630	0.4927	0.4889	
1 0 1	<b>1 1 0</b>	<b>(010)-(000)</b>		7		1572.92818	3333( 1s5)	0.4559( <b>83</b> )	0.4630	0.4927	0.4889	
1 0 1	<b>1 1 0</b>	<b>(100)-(010)</b>		6		2039.94786	6360( 79)	0.4 S26( 27)	0.4630	0.4927	0.4809	
2 0 2	<b>2 1 1</b>	<b>{020)-(010)</b>		6		1528.31120	4120( 95)	0.4317(1401)	0.4200	0.4500	0.4648	
<b>2 0 2</b>	<b>2 1 1</b>	<b>(010)-(000)</b>		8		1563. S4526	3103( 103)	0.4196( 30)	0.4200	0.4s00	0.4648	
2 0 2	<b>2 1 1</b>	<b>(010)-(000)</b>		7		1566.46895	<b>3018( 625)</b>	0.4204( 74)	0.4200	0.4500	0.4648	
2 0 2	<b>2 1 1</b>	<b>(100)-(010)</b>		6		2032.29200	3690( 707)	0.4362(252)	0.4200	0.4s00	0.4648	
3 0 3	<b>3 1 2</b>	<b>(010)-(000)</b>		8		1852.13398	<b>1410( 140)</b>	<b>0.4844( 35)</b>	0.4820	0. S223	0.5590	
3 0 3	<b>3 1 2</b>	<b>(010)-(000)</b>		7	1s8s.1s017	1330( s63)	0.4902( 601)	0.4820	0. S223	0.5s90		
4 0 4	<b>4 1 3</b>	<b>{020)-(010)</b>		6		1499.82815	-3024( <b>482</b> )	0.4 S26( 54)	0.4720	0.sssss	0.5s0s	
4 0 4	<b>4 1 3</b>	<b>(010)-(000)</b>		8		1s3s.3s8411	-1544( 474)	0.4744(103)	0.4720	0.s5s5	0.5505	
4 0 4	<b>4 1 3</b>	<b>(010)-(0001)</b>		6		1541. .9s417	-1523(1830)	0.4s90( 401)	0.4720	0.s5s5	0.s505	
<b>5 0 5</b>	<b>5 1 4</b>	<b>{020)-(010)</b>		6		1478.12345	-1092( 248)	0.4S02( 23)	0.4410	0.4737	0.s201	
<b>5 0 5</b>	<b>5 1 4</b>	<b>(010)-(000)</b>		8		1814.66212	210( 76)	0.449s( 20)	0.4410	0.4737	0.5201	
6 0 6	<b>6 1 5</b>	<b>{020)-(010)</b>		6		1453.78861	91( 421)	0.3689( 64)	0.3900	0.s6s8	0.4909	
6 0 6	<b>6 1 5</b>	<b>(010)-(000)</b>		6		1492.30883	829( 468)	0.4044( 32)	0.3900	0.4s68	0.4909	
6 0 6	6 1 S	<b>(010)-(0001)</b>		7		149s.40093	1649( 864)	0.3892( 2)	0.3900	<b>0.4568</b>	0.4909	
6 0 6	6 1 S	<b>(010)-(000)</b>		6		1490.87477	-487( 656)	0.3976(321)	0.3900	0.4568	0.4909	
7 0 7	7 1 6	<b>{0101)-(000)</b>		6		1428.8708S	2361( 392)	0.3771(120)	0.3480	0.3823	0.4023	
7 0 7	7 1 6	<b>(0101)-(000)</b>		<b>8</b>		1470.04641	1380( 1s0)	0.3762(132)	0.3480	0.3823	0.4023	
1 0 7	7 1 6	<b>(010)-(000)</b>		6		1476.42887	1421( <b>81</b> )	0.3734(291)	0.3480	0.3823	0.4023	
<b>8 0 8</b>	<b>8 1 7</b>	<b>{020)-(0101)</b>		6		1404.44406	<b>52( 296)</b>	0.3139[ 71]	0.3120	0.3s91	<b>0.3548</b>	
<b>8 0 8</b>	<b>8 1 7</b>	<b>(010)-(000)</b>		8		1448.39201	2s91( 707)	0.3082( 117)	0.3120	0.3591	<b>0.3548</b>	
8 0 8	8 1 7	<b>(0101)-(000)</b>		7		14 s1.30123	2277( 393)	0.3063( 74)	0.3120	0.3s91	0.3548	
8 0 8	8 1 7	<b>(010)-(000)</b>		6		1454.57297	1647( S4)	0.3360( 22)	0.3120	0.3s91	0.3s48	
9 0 9	9 1 8	<b>{020)-(010)</b>		6		1380.62386	1936( 412)	0.2667( <b>48</b> )	0.2600	0.2661	0.2780	
9 0 9	<b>9 1 8</b>	<b>(010)-(000)</b>		<b>8</b>		1427.19628	2146( 196)	0.2832( S4)	0.2600	0.2661	0.2780	
9 0 9	<b>9 1 8</b>	<b>(010)-(000)</b>		6		1433.20326	3091( 1s9)	0.2682( 23)	0.2600	0.2661	0.2780	
10 0 10	1 0 1 9	<b>(010)-(000)</b>		8		1406.22129	628( 1s7)	0.2282( 5)	0.23s0	0.212s	0.2353	
10 0 10	<b>10 1 9</b>	<b>(010)-(000)</b>		6		1412.07874	427( 134)	0.2461( 9S)	0.23s0	<b>0.2125</b>	0.23s3	
11 0 11	11 1 10	<b>(010)-(000)</b>		6		1391.02640	1804( 111)	0.2206( <b>83</b> )	0.2170	0.10s5	0.20s0	
<b>12 0 12</b>	<b>12 1 11</b>	<b>(010)-(000)</b>		6		1369.95302	2075( <b>54</b> )	0.2005( <b>55</b> )	0.1920	0.1ss8	0.1704	
13 0 13	13 1 12	<b>{010}-[000)</b>		6		1348.81556	<b>865( 411)</b>	0.1711( 10)	0.1620	0.1216	0.1286	
<b>14 0 14</b>	<b>14 1 13</b>	<b>(010)-(000)</b>		6		1327.59093	<b>2014( 907)</b>	0.1613( <b>82</b> )	0.1570	0.1013		
15 0 1s	15 1 14	<b>{010)-(000)</b>		6		1304.30272	-995(2500)	0.1530( 51)	0.1500	0.0905		
2 1 1	2 2 0	<b>{020)-(010)</b>		6		1511.85956	-2762( 322)	0.4419(212)	0.4220	0.4867	0.46s8	
2 1 1	2 2 0	<b>(010)-(000)</b>		8		1SS1.9S026	-926( 143)	0.4391( 6)	0.4220	0.4967	0.4658	
3 1 2	3 2 1	<b>{020)-(010)</b>		6		1S1S.29141	-1380( <b>289</b> )	0.4207( 31)	0.4400	0.4647	0. S060	
3 1 2	3 2 1	<b>(010)-(000)</b>		8		1s8s. s9873	-120s( 404)	0.4186(178)	0.4400	0.4647	0. S060	
<b>3 1 2</b>	3 2 1	<b>(100)-(010)</b>		6		2008.07S7s1	23SS( 1s7)	0.44s3( 27)	0.4400	0.4647	0.5060	
4 1 3	4 2 2	<b>{020)-(010)</b>		6		1S1S.6738S	-268( S1589)	0.4260( 67)	0.4s10	0.4617	0.5091	
4 1 3	4 2 2	<b>(010)-(000)</b>		8		1553.79439	-1030( 87)	0.4480( 22)	0.4510	0.4817	0.5091	
4 1 3	4 2 2	<b>(010)-(000)</b>		7		1586. S7647	-1731(1036)	0.4386 [103]	0.4s10	0.4817	0.5091	
4 1 3	4 2 2	<b>(010)-(000)</b>		6		1559.69017	<b>-2324( 257)</b>	0.4 S19(298)	0.4510	0.4817	0.5091	
5 1 4	5 2 3	<b>{020)-(010)</b>		6		1511.48586	-1668( 18s)	0.4491( 22)	0.4s10	0.4721	0.5123	
5 1 4	5 2 3	<b>(010)-(000)</b>		8		1551.06033	<b>278( 399)</b>	0.4454( 71)	0.4510	0.4721	0.5123	
5 1 4	5 2 3	<b>(100)-(010)</b>		6		1995.56739	580( 79)	0.4610(168)	0.4510	0.4711	0.5123	
6 1 S	6 2 4	<b>(010)-(000)</b>		<b>8</b>		1536.85073	3s5( <b>88</b> )	0.4392( 47)	0.4370	0.5392	0.s335	
6 1 5	6 2 4	<b>(010)-(000)</b>		6		1543.49026	1644( 83)	0.4446( 51)	0.4370	0. S392	0.s335	
7 1 6	7 2 S	<b>{020)-(010)</b>		6		1406.74361	2s21( 470)	0.4137( 43)	0.4150	0.4700	0.4871	
7 1 6	7 2 5	<b>(010)-(000)</b>		6		<b>1527.32040</b>	2130( 354)	0.4500(299)	0.4150	0.4700	0.4871	
8 1 7	8 2 6	<b>{020)-(010)</b>		6		1467.02503	-733( 412)	0.3782( <b>68</b> )	0.3810	0.4536	0.4461	
8 1 7	8 2 6	<b>(010)-(000)</b>		<b>8</b>		<b>1500.28333</b>	1570( 1323)	0.3602( 3s)	0.3810	0.4536	0.4461	
8 1 7	<b>8 2 6</b>	<b>(010)-IOOO</b>		7		1503.6SS33	79( 707)	0.3823( 4S)	<b>0.3810</b>	0.4536	0.4461	
<b>8 1 7</b>	8 2 6	<b>(010)-(000)</b>		6		1807.44238	20( 97)	0.3913( 70)	0.3810	0.4536	0.4461	
9 1 8	<b>9 2 7</b>	<b>{020)-(010)</b>		6		1444.75228	-146s( 323)	0.3224( 1s)				

table 2. continued

upper x J KA KC	lower J KA KC	band	mol.	frequency (computed)	shift (ehrs.)	width			
						(ohm.)	smoothed	HITRAN	BK
8 1 8	8 2 7	(020)-(010)	6	1600.08708	2220( 67S)	0.2938[ 94)	0.3100	0.372S	0.325S
6 1 6	<b>8 2 7</b>	(010)-(000)	8	1446.15187	193( 624)	0.3108(134)	0.3100	0.3725	0.325S
<b>6 1 6</b>	8 2 7	(0101)-(0001)	7	1648.93961	-576( 370)	0.3079( 80)	0.3100	0.372S	0.325S
8 1 8	<b>8 2 7</b>	(010)-{000}	6	1452.06660	<b>788( 65)</b>	0.3102( 43)	0.3100	0.372S	0.325S
9 1 9	9 2 8	(010)-(000)	8	1426.13131	2512( 462)	0.2641(108)	0.2750	0.2722	0.2042
9 1 9	9 2 8	(010)-(000)	6	1431.99023	3533( 211)	0.273S( <b>62</b> )	0.2750	0.2722	0.2042
1 0 1 1 0 1 0 2 9	(020I)-(010)	6	1356.03845	1021( S64)	0.2376 [18S)	0.2420	0.2169	0.2319	
1 0 1 1 0 1 0 2 9	(010)-{000}	8	1405.72603	471( 462)	0.2238( 83)	0.2420	0.2169	0.2319	
10 1 1 0 1 0 2 9	(010)-[000]	6	1411. S0558	588( 79)	0.2403( 60)	0.2420	0.2169	0.2319	
11 1 11 11 <b>2</b> 10	(010)-{000}	6	1390.7s635	1348( 266)	0.2177( 67)	0.2130	<b>0.1882</b>	0.0205	
1 2 1 1 2 1 2 2 1 1	(010)-(000)	6	1369.82772	1771( 341)	0.1964( 67)	0.1900	0.1616	0.1704	
1 3 1 1 3 1 3 2 1 2	(0101)-(000)	6	1348.75665	1037( 434)	0.1702( 37)	0.1720	0.1250	0.0129	
1 4 1 1 4 1 4 2 1 3	(010)-(000)	6	1327.57118	821( <b>510</b> )	0.1s08( 47)	0.1600	0.1047		
1 s 1 1 5 1 5 2 1 4	(010)-{000}	6	1306.28920	4633( 393)	0.1762( 2)	0.1600	0.0925		
1 6 1 1 6 1 6 2 1 5	(010)-(000)	6	1284.92717	785(1884)	0.1 S79(148)	0.1550	0.0786		
3 2 1 3 3 0	(020)-(010)	6	1485.13356	-8s9( 436)	0.3988( 43)	0.4130	0.4309	0.4749	
3 2 1 3 3 0	(010)-(000)	8	1528.98333	-1292( <b>25</b> )	0.4107( 8)	0.4130	0.4309	0.4749	
3 2 1 3 3 0	(010)-(000)	7	1531. s1129	-1269( 657)	0.43 S0(259)	0.4130	0.4309	0.4749	
<b>5 2 3</b>	5 3 2	(010)-(000)	7	1542.53773	-1747(1867)	0.409 S(200)	0.4190	0.4313	0.4726
5 2 3	5 3 2	(010)-(000)	6	1545.15664	-1313( 68)	0.4100(400)	0.4190	0.4313	0.4726
<b>6 2 4</b>	6 3 3	(010)-(000)	7	1546.86821	-2s12( 471)	0.4176(109)	0.4170	0.4845	0.5079
6 2 4	6 3 3	{010)-(000)	6	1549.64172	-3164( 169)	0.4174( 32)	0.4170	0.404s	0.5079
7 2 5	7 3 4	(020)-{010}	6	1504.61314	-1857( 622)	0.4178( <b>68</b> )	0.4170	0.4s09	<b>0.5192</b>
7 2 5	S 7 3 4	(010)-(000)	7	1547.20788	-4083( 628)	0.4174( 80)	0.4170	0.4509	0. S192
7 2 5	7 3 4	(010)-(0001)	6	1550.23398	<b>-3301( 179)</b>	0.4448(328)	0.4170	0.4509	0. S192
8 2 6	<b>8 3 5</b>	(020)-{010}	6	1502.43612	-3455( 340)	0.4214( 47)	0.4170	0.4648	0.4786
8 2 6	8 3 s	(010)-(000)	6	1545.65528	10s9( 9s)	0.4187( 63)	0.4170	0.4648	0.4786
9 2 7	9 3 6	(020)-(010)	6	1494.87161	3s07( 412)	0.3862(106)	0.4110	0.4400	0.4s76
9 2 7	9 3 6	(010)-(000)	6	1535.47898	2318( 76)	0.4022( 65)	0.4110	0.4408	0.4576
1 1 2 9 1 1 3 8	(010)-(000)	6	1501.63224	180( 254)	0.3393( 94)	0.3480	0.373s	0.3804	
13 <b>2</b> 11 13 3 10	(010)-(000)	6	1462.36521	536( 806)	0.2443( 30)	0.2500	0.2s02	<b>0.2591</b>	
<b>14</b> 2 1 2 1 4 3 1 1	(010)-(000)	6	1443.96067	-1963( 236)	0.2021( <b>8</b> )	0.2110	0.1838		
1 5 2 1 3 1 5 3 1 2	(010)-(000)	6	1426. S5517	<b>-1806( 79)</b>	0.1896(140)	0.1820	0.16s2		
3 2 2 3 3 1	(020)-(0101)	6	1480.22924	<b>-1963( 550)</b>	0.3737( 68)	0.3930	0.4646	0.4664	
3 2 2 3 3 1	(010)-(0001)	8	1523.48213	-1s29( <b>45</b> )	0.3972(161)	0.3930	0.4646	0.4664	
3 2 2 3 3 1	(010)-(000)	6	1528. S6823	-821( <b>181</b> )	0.4032(236)	0.3930	0.4646	0.4664	
4 2 3 4 3 2	(020)-(010)	6	1477.24077	-1910( 70)	0.3785( 20)	0.3800	0.4388	0.4735	
4 2 3 4 3 2	(010)-(000)	6	1525.49967	-2488( 181)	0.3723( 71)	0.3800	0.4385	0.473s	
6 2 S 6 3 4	(020)-(010)	6	1464.45049	-1502( 696)	0.3424(111)	0.3600	0.4320	0.4789	
6 2 5 6 3 4	(010)-(0000)	7	1509.39922	1630( 300)	0.3480(100)	0.3600	0.4320	0.4789	
7 2 6 7 3 5	(020)-(010)	6	1454.21331	-236( 236)	0.3299( 12)	0.3270	0.371s	0.4104	
7 2 6 7 3 5	(010)-(000)	6	1501.04563	-23s( 99)	0.3s10( 32)	0.3270	0.371s	0.4104	
<b>8 2 7</b>	8 3 6	(020)-(010)	6	1441. s4070	<b>-680( 751)</b>	0.3137(102)	0.30s0	0.4093	0.3s97
<b>8 2 7</b>	8 3 6	(010)-(000)	8	1483.17142	1s08( 547)	0.3175(106)	0.3050	0.4093	0.3s97
<b>8 2 7</b>	8 3 6	(010)-(000)	7	1485.94500	1649( 79)	0.2927( 61)	0.3050	0.4093	0.3s97
8 2 7	6 3 6	(010)-(000)	6	1489.04990	887( 76)	0.3217( 33)	0.30s0	0.4093	0.3s597
9 2 8	9 3 7	(020)-(010)	6	1426.81000	<b>-3848( 5s0)</b>	0.3215(143)	<b>0.2920</b>	0.34s1	0.3s51
9 2 8	9 3 7	(010)-(000)	6	1474.36234	-1127( <b>104</b> )	0.3222( 83)	0.2920	0.3451	0.3ss1
1 0 2 9 1 0 3 8	(020)-(010)	6	1410.50149	-2277( 79)	0.2491( <b>12</b> )	0.2680	<b>0.3148</b>	0.3076	
1 1 2 1 0 1 1 3 9	(010)-(000)	6	1441.34386	339( 3s)	0.248s( 33)	0.2370	0.2543	0.2s79	
12 <b>2</b> 11 <b>12</b> 3 10	(010)-(000)	6	1423.87258	<b>1081( 1381</b> )	0.1983( 61)	0.2000	0.1963	0.2072	
1 3 2 1 2 1 3 3 1 1	(010)-(000)	6	1406.15060	5s7( 348)	0.1987( 61)	0.1870	0.1829	0.0180	
1 4 2 1 3 1 4 3 1 2	(010)-(000)	6	1388.34836	98( 718)	0.1640( 40)	0.1580	0.1486		
4 3 1 6 4 0	(020)-(010)	6	1469.10832	1884( 256)	0.3067( <b>83</b> )	0.3200	0.3482	0.4062	
4 3 1 6 4 0	(010)-(000)	8	<b>1513.19751</b>	129( 470)	0.3306(12s)	0.3200	0.3482	0.4062	
<b>4 3 1 4 6 0</b>	(010)-(000)	6	1517.78143	100( 300)	0.3284( S1)	0.3200	0.3482	<b>0.4062</b>	
5 3 2 5 4 1	(020)-(010)	6	1470.86881	1010( 377)	0.3245( <b>61</b> )	0.3610	0.4107	0.4s03	
5 3 2 5 4 1	(010)-(000)	8	1515.66171	-314( 100s)	0.3665(154)	0.3610	0.4107	0.4s03	
S 3 2 5 4 1	(010)-(000)	6	1520.15303	1997(2768)	0.3553( 1s6)	0.3610	0.4107	0.4503	
6 3 3 6 4 2	(010)-(000)	8	1520.45862	-1286( 281)	0.4092( 70)	0.38s0	0.45s6	<b>0.4874</b>	
6 3 3 6 4 2	(010)-(000)	6	1524.80939	-930( <b>85</b> )	0.3708( 12)	0.3850	0.45s6	0.4874	
7 3 4 7 4 3	(020)-(010)	6	1480.69774	-2408( 741)	0.3554( 64)	0.3930	0.4619	0.4936	
7 3 4 7 4 3	(010)-(000)	7	1529.38023	<b>1178( 393)</b>	0.3782( 83)	0.3930	0.4619	0.4936	
7 3 4 7 4 3	(010)-(000)	6	1531.63815	-832( 328)	0.3979( 13)	0.3930	0.4619	0.4936	
0 3 5 8 4 4	(010)-(000)	8	1534. <b>56488</b>	-550( <b>79</b> )	0.3735(166)	0.3980	0.435s	0.4063	
9 3 6 9 4 5	(020)-(010)	6	1495.03794	-2041( 942)	0.3503( s)	0.3930	0.4304	0.4s27	
9 3 6 9 4 5	(010)-(000)	6	1544.43s09	-4420( 202)	0.4019( 61)	0.3930	0.4304	0.4s27	
1 0 3 7 1 0 4 6	(010)-(000)	6	1545.80586	310( 90)	0.4322( 35)	0.4130	0.4697	0.4737	
1 2 3 9 1 2 4 8	(010)-(000)	6	1532.89038	S80(1512)	0.3733( <b>20</b> )	0.3930	<b>0.4385</b>	0.440s	
1 3 3 1 0 1 3 4 9	(010)-(000)	6	1519.01771	1145( 693)	0.3415( 91)	0.3380	0.3598	0.3715	
<b>4 3 2 4 4 1</b>	(020)-(010)	6	1468.26684	1877( 35s)	0.2974( 77)	0.3200	0.3660	0.4027	
4 3 2 4 4 1	(010)-(000)	7	1514.25426	1256( 626)	0.3170( 11)	0.3200	0.3660	0.4027	
<b>4 3 2 4 4 1</b>	(010)-(000)	6	1516.70794	121s( 197)	0.3 s23(211)	0.3200	0.3660	0.4027	
5 3 3 5 4 2	(020)-(010)	6	1467.79752	-628( 314)	0.3060( 27)	0.3350	0.3741	0.4088	
5 3 3 5 4 2	(010)-(000)	8	1511.59436	277( 447)	0.3328( 86)	0.3350	0.3741	0.4088	
5 3 3 5 4 2	(010)-(000)	7	1513.81311	262( 323)	0.3332( 35)	0.3350	0.3741	0.4088	
5 3 3 5 4 2	(010)-(000)	6	1516.29327	717( 67)	0.3342( 60)	0.3350	0.3741	0.4088	
6 3 4 6 4 3	(020)-(010)	6	1466.58460	-20s1( 566)	0.2909( 23)	0.3400	0.3s01	0.4221	
6 3 4 6 4 3	(010)-(000)	8	1510.18452	-1518( 215)	0.3268(217)	0.3400	0.3s01	0.4221	
6 3 4 6 4 3	(010)-(000)	6	1534.98745	-2430( 147)	0.3'451( 171)	0.3400	0.3501	0.4221	
7 3 s 7 4 4	(020)-(010)	6	1464.10646	-2565( S19)	0.2647(125)	0.3230	0.5321	0.3803	
7 3 5 7 4 4	(010)-(000)	6	1512.21051	-4000( 157)	0.3221( 75)	0.3230	0.5321	0.3803	
8 3 6 0 4 5	(020)-(010)	6	1459.88910	-34ss( 315)	0.3304(129)	0.3140	0.3545	0.3687	
8 3 6 8 4 5	(010)-(000)	8	1502.28511	-400( <b>544</b> )	0.3214(194)	0.3140	0.3545	0.3687	
8 3 6 8 4 5	(010)-(000)	6	1507.48408	-962( 165)	0.3161( 32)	0.3140	0.3s45	0.3687	
9 3 7 9 4 6	(010)-(000)	8	149s. S06173	-s50( 79)	0.3204( 51)	0.31s0	0.3682	0.3763	
9 3 7 9 4 6	(010)-(000)	6	1500.54588	-130( 176)	0.3363( 71)	0.31s0	0.3682	0.3763	
1 0 3 8 1 0 4 7	(010)-(000)	6	1405.65441	-1178( 236)	0.2914( 10)	0.2950	0.3555	0.3504	
10 3 0 1 0 4 7	[010)-(000)	6	1491.39035	<b>-682( 132</b> )	0.3289(131)	0.2980	0.3555	0.3504	
<b>11 3 9 11 4 8</b>	{010)-(000)	6	1480.24019	-1142( 388)	0.2891( 23)	0.2780	0.3127	0.3090	
<b>12 3 1 0 1 2 4 9</b>	{010)-(000)	6	1467.47248	-1963( <b>63</b> )	0.2691( 44)	0.2600	0.2513	0.2s94</	

**Table 3. Comparison of H<sub>2</sub>O self-broadening coefficients for transitions involving the same rotational quantum numbers<sup>+</sup>**

Upper JKAKC	Lower J KA KC	band	iso	Frequency (computed)	Shift (obs.)	----- (obs.)	Width smoothed rat io
1 0 1	1 1 0	(010)-(000)	<b>7</b>	1572.92818	3333( 185)	0.4559( 83)	0.463 0.985
1 0 1	1 1 0	(010)-(OCJO)	<b>8</b>	1570.02258	3420( 254 )	0.4604( 88)	0.463 0.994
1 0 1	1 1 0	(020)-(010)	6	1534.93544	<b>5472( 279)</b>	0.4413( 32)	0.463 0.953
1 0 1	1 1 0	(100)-(010)	6	2039.94789	6360( 79)	0.4526( 27)	0.463 0.978
1 1 0	1 0 1	(010)-(000)	<b>7</b>	1613.09923	-6264( 255)	0.4677( 12)	0.463 1.010
1 1 0	1 0 1	(010)-(000)	<b>8</b>	1609.87981	-6021( 180)	0.4650( 35)	0.463 <b>1.004</b>
1 1 0	1 0 1	(020)-(010)	6	1583.35619	-4555( 34)	0.4334( 32)	0.463 0.936
1 1 0	1 0 1	(100)-(010)	6	2079.93401	157( 559)	0.4641(228)	0.463 <b>1.002</b>
1 1 0	2 2 1	(010)-(000)	6	1505.60428	-4302( 686)	0.4800( 89)	0.485 0.989
1 1 0	2 2 1	(010)-(000)	7	1502.72747	-2865( 280)	0.4872( 82)	0.485 1.005
1 1 0	2 2 1	(010)-(000)	8	1500.15891	-2607( 54)	0.4800( 25)	0.485 0.989
1 1 0	2 2 1	(020)-(010)	6	1459.60771	-5686( 141)	0.4233( 22)	0.485 0.873
1 1 0	2 2 1	(100)-(010)	6	1956.18553	-2905( 864)	0.4480( 41)	0.485 0.924
2 2 1	1 1 0	(010)-(000)	8	1692.19509	4364( 62)	0.4658( 15)	0.485 0.960
2 2 1	1 1 0	(100)-(010)	6	2148.18853	3978( 1075)	0.4689(100)	0.485 0.967
2 0 2	2 1 1	(010)-(000)	7	7566.48895	3018( 625)	0.4204( 74)	0.420 <b>1.001</b>
2 0 2	2 1 1	(010)-(000)	8	1563.54526	3103( 103)	0.4196( 30)	0.420 0.999
2 0 2	2 1 1	(020)-(010)	6	1528.31120	4120( 95)	0.4317(140)	0.420 1.028
2 0 2	2 1 1	(100)-(010)	6	2032.29200	3690( 707)	0.4382(252)	0.420 1.043
2 1 1	2 0 2	(010)-(000)	<b>7</b>	1619.98809	-1502( 484)	0.4163( 77)	0.420 0.991
2 1 1	2 0 2	(020)-(010)	<b>6</b>	1590.38134	-6181( 156)	0.4271( 30)	0.420 1.017
2 1 2	2 2 1	(010)-(000)	8	1536.56131	1648( 97)	0.4738( 47)	0.478 0.991
<b>2 1 2</b>	<b>2 2 1</b>	(020)-(010)	6	1495.61167	-134( 65)	0.4308( 5)	0.478 0.901
2 2 1	2 1 2	(010)-(000)	7	1658.80020	417( 599)	0.4984(166)	0.478 1.043
2 2 1	2 1 2	(010)-(000)	8	1655.22987	1108( 225)	0.4868( 35)	0.478 1.018
2 2 1	2 1 2	(020)-(010)	6	1639.08392	271( 671)	0.4460( 74)	0.478 0.933
2 2 1	2 1 2	(100)-(010)	6	2111.63298	-2512( 314)	0.4402( 79)	0.478 0.921
3 0 3	<b>4 1 4</b>	(010)-(000)	6	1507.05833	-1890( 299)	0.4900(299)	0.483 1.014
3 0 3	<b>4 1 4</b>	(010)-(000)	7	1503.95603	-488( 110)	0.4927( 83)	0.483 1.020
3 0 3	<b>4 1 4</b>	(010)-(000)	8	1501.18834	76( 54)	0.4971( 32)	0.483 1.029
3 0 3	<b>4 1 4</b>	(020)-(010)	6	1467.64569	-2089( 95)	0.4608( 2)	0.483 0.954
3 0 3	<b>4 1 4</b>	(100)-(010)	6	1969.77534	864( 236)	0.4984(108)	0.483 1.032
<b>4 1 4</b>	3 0 3	(010)-(000)	8	1677.75049	-681( 44)	0.4917( 32)	0.483 1.018
<b>4 1 4</b>	3 0 3	(020)-(010)	<b>6</b>	1649.80758	2881( 56)	0.4871( 41)	0.483 1.008
4 1 4	3 0 3	(100)-(010)	<b>6</b>	2145.67852	1832( 534)	0.4934( 89)	0.483 1.021
4 0 4	5 1 5	(010)-(000)	6	1490.82571	-4621( 265)	0.4500(350)	0.455 0.989
4 0 4	5 1 5	(010)-(000)	7	1487.73172	-4069(1364)	0.4551(188)	0.455 1.000
4 0 4	5 1 5	(010)-(000)	8	1484.97158	-4440( 271)	0.4545( 40)	0.455 0.999
4 0 4	5 1 5	(020)-(010)	6	1452.46878	-3620( 307)	0.4338(106)	0.455 0.953
5 1 5	4 0 4	(010)-(000)	6	1700.77632	3490( 733)	0.4400(410)	0.455 0.967
5 1 5	4 0 4	(010)-(000)	7	1697.03399	2953( 577)	0.4460(168)	0.455 0.980
5 1 5	4 0 4	(010)-(000)	8	1693.69951	2972( 94)	0.4508( 17)	0.455 0.991
5 1 5	4 0 4	(020)-(010)	6	1665.02900	5288( 70)	0.4361( 54)	0.455 0.958
5 1 5	4 0 4	(100)-(010)	6	2160.00526	4790( 550)	0.4487( 17)	0.455 0.986
<b>4 1 4</b>	5 0 5	(010)-(000)	6	1496.24891	-19( 98)	0.4682(117)	0.437 1.071
4 1 4	5 0 5	(010)-(000)	7	1492.96540	-37( 544)	0.4538( 60)	0.437 1.038
<b>4 1 4</b>	5 0 5	(020)-(010)	6	1460.93771	1568( 361)	0.4396( 15)	0.437 1.006
4 1 4	5 0 5	(100)-(010)	6	1956.80865	-1570( 314)	0.4425( 12)	0.437 1.012
5 0 5	<b>4 1 4</b>	(010)-(000)	7	1692.36935	2294( 148)	<b>0.4541( 43)</b>	0.437 1.039
5 0 5	<b>4 1 4</b>	(010)-(000)	8	1689.19409	2379( 229)	0.4490(115)	0.437 1.027
5 0 5	<b>4 1 4</b>	(020)-(010)	6	1657.38969	1546( 70)	0.4350( 57)	0.437 0.995
5 0 5	<b>4 1 4</b>	(100)-(010)	6	2154.71130	1570( 471)	0.4284(105)	0.437 0.980

<sup>+</sup>for the isotope, 6, 7,8 = H<sub>2</sub><sup>16</sup>O, H<sub>2</sub><sup>17</sup>O, H<sub>2</sub><sup>18</sup>O, respectively.  
Widths are in units of cm<sup>-1</sup>/atm and shifts in cm<sup>-1</sup>/atm × 10<sup>3</sup>.

**Table 4.** Pairs of smoothed self-broadened H<sub>2</sub>O widths b°(cm<sup>-1</sup>/atm) which do not have equal values for rotational reversal (see text).

smoothed width						smoothed width						cliff.	cliff.								
J	K	A	KC	R or Q(+)	P or Q(-)	J	K	A	KC	R or Q(+)	P or Q(-)	cliff.	cliff.								
643	5	5	0	0.2810	0.3070	-0.0260	1	0	4	7	9	3	6	0.3800	0.4000	-0.0200					
7	4	4	6	5	1	0.2840	0.3100	-0.0260	11	4	8	103	7	0.3600	0.3870	-0.0270					
8	4	5	7	5	2	0.2910	0.3120	-0.0210	124	9	11	3	8	0.3300	0.3500	-0.0200					
946	8	5	3	0.3100	0.3400	-0.0300	5	5	1	4	4	0	0	0.3030	0.2600	0.0430					
104	7	9	5	4	0.3360	0.3530	-0.0170	6	5	2	5	4	1	0	0.3150	0.2680	0.0470				
11	48	10	5	5	0.3520	0.3630	-0.0110	75	3	64	2	0	0	0	0.3220	0.2880	0.0340				
12	4	9	11	5	6	0.3620	0.3770	-0.0150	8	5	4	7	4	3	0	0.3380	0.3130	0.0250			
13	4	10	12	5	7	0.3700	0.3800	-0.0100	9	5	5	8	4	4	0	0.3520	0.3450	0.0070			
642	5	5	1	0.2780	0.3100	-0.0320	5	50	44	1	0	0	0	0.3030	0.2700	0.0330					
7	4	3	6	5	2	0.3100	0.3400	-0.0300	6	5	1	5	4	2	0	0.3100	0.2710	0.0390			
8	4	4	7	5	3	0.3460	0.3570	-0.0110	75	2	64	3	0	0	0	0.3100	0.2720	0.0380			
9	4	5	8	5	4	0.3720	0.3830	-0.0110	8	5	3	7	4	4	0	0.3120	0.2850	0.0270			
10	4	6	9	5	5	0.3880	0.4000	-0.0120	9	5	4	8	4	5	0	0.3150	0.3120	0.0030*			
11	4	7	10	5	6	0.3700	0.3920	-0.0220	1	0	5	5	9	4	6	0	0.3270	0.3520	-0.0250		
12	4	8	11	5	7	0.3500	0.3680	-0.0180	11	5	6	104	7	0	0	0.3380	0.3810	-0.0430			
13	4	9	12	5	8	0.3100	0.3370	-0.0270	12	5	7	11	48	0	0	0.3180	0.3700	-0.0520			
14	4	10	13	5	9	0.2500	0.2800	-0.0300	13	5	8	12	4	9	0	0.3220	0.3620	-0.0400			
15	4	11	14	5	10	0.2000	0.2150	-0.0150	1	4	5	9	1	3	4	1	0	0.3380	0.3510	-0.0130	
753	6	6	0	0.2320	0.2600	-0.0280	7	6	2	6	5	1	0	0.2520	0.2200	0.0320					
8	5	4	7	6	1	0.2210	0.2880	-0.0670	8	6	3	7	5	2	0	0.2830	0.2400	0.0430			
9	5	5	8	6	2	0.2320	0.2900	-0.0580	9	6	4	8	5	3	0	0.3020	0.2520	0.0500			
1	0	5	6	9	3	0.2420	0.2900	-0.0480	106	5	9	5	4	0	0	0.3100	0.2620	0.0480			
11	5	7	10	64	0	0.2620	0.2950	-0.0330	11	66	10	5	5	0	0	0.3200	0.3020	0.0180			
12	5	8	11	6	5	0.2900	0.3020	-0.0120	76	1	65	2	0	0	0	0.2370	0.2100	0.0270			
7	5	2	6	6	1	0.2400	0.2610	-0.0210	8	6	2	7	5	3	0	0.2600	0.2200	0.0400			
8	5	3	7	6	2	0.2480	0.2810	-0.0330	963	8	5	4	0	0	0	0.2880	0.2380	0.0500			
95	4	86	3	0.2680	0.3020	-0.0340	1	0	6	4	9	5	5	0	0.3020	0.2570	0.0450				
10	0	5	5	9	4	0.2900	0.3250	-0.0350	11	6	5	10	5	6	0	0.3020	0.2740	0.0280			
11	56	10	6	5	0	0.3140	0.3480	-0.0340	12	66	11	5	7	0	0	0.2950	0.2930	0.0020			
12	5	7	11	6	6	0.3200	0.3420	-0.0220	136	7	12	5	8	0	0	0.2700	0.3020	-0.0320			
13	5	8	12	6	7	0.3100	0.3200	-0.0100	14	68	13	5	9	0	0	0.2620	0.3100	-0.0480			
863	7	7	0	0.1900	0.2200	-0.0300	1	5	6	9	1	4	5	1	0	0.2680	0.3100	-0.0420			
964	8	7	1	0.2100	0.2500	-0.0400	1	6	6	10	5	5	1	0	0.2880	0.3050	-0.0170				
1	0	6	5	9	7	2	0.2300	0.2720	-0.0420	1	7	6	11	1	6	5	12	0	0.3300	0.2970	0.0330
11	66	10	7	3	0	0.2550	0.3000	-0.0450	7	7	1	6	6	0	0	0.1900	0.1680	0.0220			
12	67	11	7	4	0	0.2800	0.3170	-0.0370	8	7	2	7	6	1	0	0.2180	0.1820	0.0360			
13	68	12	7	5	0	0.3000	0.3270	-0.0270	9	7	3	8	6	2	0	0.2400	0.1980	0.0420			
14	6	9	13	7	6	0.3050	0.3180	-0.0130	1	0	7	4	9	6	3	0	0.2600	0.2060	0.0540		
15	5	6	1	0	1	4	7	7	0.3070	0.3150	-0.0080	11	7	5	10	64	0	0	0.2780	0.2120	0.0660
8	6	2	7	7	1	0.1900	0.2200	-0.0300	12	76	11	6	5	0	0	0.2930	0.2330	0.0600			
9	6	3	8	7	2	0.2100	0.2500	-0.0400	13	7	7	12	66	0	0	0.3090	0.2550	0.0540			
1	0	6	4	9	7	3	0.2300	0.2720	-0.0420	14	78	13	6	7	0	0	0.3100	0.2850	0.0250		
11	65	10	7	4	0	0.2550	0.3000	-0.0450	77	0	66	1	0	0	0	0.1900	0.1550	0.0350			
12	66	11	7	5	0	0.2800	0.3170	-0.0370	8	7	1	7	6	2	0	0.2100	0.1700	0.0400			
13	6	7	12	7	6	0	0.3000	0.3270	-0.0270	9	7	2	8	63	0	0	0.2360	0.1880	0.0480		
14	68	13	7	7	0	0.3050	0.3180	-0.0130	1	0	7	3	9	6	4	0	0.2540	0.2000	0.0540		
15	69	14	7	8	0	0.3070	0.3150	-0.0080	11	74	10	6	5	0	0	0.2700	0.2130	0.0570			
9	73	88	0	0.1470	0.1980	-0.0510	12	7	5	11	66	0	0	0	0.2900	0.2320	0.0580				
1	0	7	4	9	8	1	0.1800	0.2300	-0.0500	13	76	12	6	7	0	0	0.2960	0.2420	0.0540		
11	75	10	8	2	0	0.2100	0.2600	-0.0500	14	7	7	13	68	0	0	0.2880	0.2570	0.0310			
12	76	11	8	3	0	0.2370	0.2820	-0.0450	15	7	8	14	6	9	0	0.2750	0.2700	0.0050*			
13	77	12	8	4	0	0.2520	0.2930	-0.0410	1	6	7	9	1	5	6	1	0	0.2650	0.2820	-0.0170	
14	78	13	8	5	0	0.2670	0.3030	-0.0360	1	7	7	10	6	1	1	0	0	0.2500	0.2880	-0.0380	
15	79	14	8	6	0	0.2820	0.3090	-0.0270	8	8	1	7	7	0	0	0.1490	0.1380	0.0110			
1	6	7	1	0	1	5	8	7	0.2890	0.3100	-0.0210	9	8	2	8	7	1	0	0.1680	0.1570	0.0110
9	7	2	8	8	1	0.1470	0.1980	-0.0510	8	8	0	7	7	1	0	0.1490	0.1380	0.0110			
1	0	7	3	9	8	2	0.1800	0.2300	-0.0500	9	8	1	8	7	2	0	0.1680	0.1570	0.0110		
11	74	10	8	3	0	0.2100	0.2600	-0.0500	11	1	10	11	0	11	0	0	0.2050	0.2170	-0.0120		
12	75	11	8	4	0	0.2370	0.2820	-0.0450	12	1	11	12	0	12	0	0	0.1820	0.1920	-0.0100		
13	76	12	8	5	0	0.2520	0.2930	-0.0410	13	1	12	13	0	13	0	0	0.1520	0.1620	-0.0100		
14	77	13	8	6	0	0.2670	0.3030	-0.0360	1	4	1	1	3	1	4	0	14	0.1470	0.1570	-0.0100	
15	78	14	8	7	0	0.2820	0.3090	-0.0270	1	5	1	1	4	1	5	0	15	0.1370	0.1500	-0.0130	
16	79	15	8	8	0	0.2890	0.3100	-0.0210	1	6	1	1	5	1	6	0	16	0.1170	0.1480	-0.0310	

Table 4 continual

smoothed width						smoothed width							
JKAKC	J	KA	KC	R or Q(+)	P or Q(-)	cliff.	JKAKC	J	KA	KC	R or Q(+)	P or Q(-)	cliff.
1 0 8 3 9 9 0				<b>0.1280</b>	0.1490	-0.0210	1 7 1 1 6 1 7 0 1 7				0.1070	0.1430	-0.0360
1 1 8 4 1 0 9 1				0.1640	0.1840	-0.0200	1 9 1 1 8 1 9 0 1 9				0.1000	0.1430	-0.0430
1 2 8 5 1 1 9 2				0.1720	0.1920	-0.0200	1 2 2 1 1 1 2 1 1 2				0.1820	0.1900	-0.0080
1 3 8 6 1 2 9 3				0.1980	0.2180	-0.0200	1 3 2 1 2 1 3 1 1 3				0.1500	0.1720	-0.0220
1 4 8 7 1 3 9 4				0.1860	0.2070	-0.0210	1 4 2 1 3 1 4 1 1 4				0.1330	0.1600	-0.0270
1 0 8 2 9 9 1				0.1280	0.1490	-0.0210	1 5 2 1 4 1 5 1 1 5				0.1190	0.1600	-0.0410
1 1 8 3 1 0 9 2				0.1640	0.1840	-0.0200	1 6 2 1 5 1 6 1 1 6				0.1120	0.1550	-0.0430
1 2 8 4 1 1 9 3				0.1720	0.1920	-0.0200	1 8 2 1 7 1 8 1 1 8				0.1000	0.1500	-0.0500
1 3 8 5 1 2 9 4				0.1980	0.2180	-0.0200	2 0 2 1 9 2 0 1 2 0				0.0930	0.1450	-0.0520
1 4 8 6 1 3 9 5				0.1860	0.2070	-0.0210	4 4 1 4 3 2				0.3400	0.3200	0.0200
1 8 3 1 6 1 7 2 1 5				0.1100	0.1200	-0.0100	5 4 2 5 3 3				0.3600	0.3350	0.0250
4 4 1 3 3 0				0.3710	0.3400	0.0310	6 4 3 6 3 4				0.3580	0.3400	0.0180
5 4 2 4 3 1				0.3820	0.3500	0.0320	7 4 4 7 3 5				0.3520	0.3230	0.0290
6 4 3 5 3 2				0.3950	0.3600	0.0350	8 4 5 8 3 6				0.3450	0.3140	0.0310
7 4 4 6 3 3				0.4100	0.3680	0.0420	9 4 6 9 3 7				0.3200	0.3150	0.0050*
8 4 5 7 3 4				0.4020	0.3740	0.0280*	1 0 4 7 1 0 3 8				0.2880	0.2950	-0.0070
9 4 6 8 3 5				0.3920	0.3930	-0.0010	1 1 4 8 1 1 3 9				0.2560	0.2780	-0.0220
1 2 4 9 1 2 3 1 0				0.2100	0.2600	-0.0500	7 6 2 7 5 3				0.2620	0.2090	0.0530
1 3 4 1 0 1 3 3 1 1				0.1960	0.2080	-0.0120	8 6 3 8 5 4				0.2860	0.2180	0.0680
1 4 4 1 1 1 4 3 1 2				0.1880	0.1970	-0.0090	9 6 4 9 5 5				0.2950	0.2320	0.0630
1 5 4 1 2 1 5 3 1 3				0.1810	0.1900	-0.0090	1 0 6 5 1 0 5 6				0.2970	0.2480	0.0490
5 5 0 5 4 1				0.3110	0.2180	0.0930	1 1 6 6 1 1 5 7				0.2880	0.2600	0.0280
6 5 1 6 4 2				0.3440	0.2680	0.0760	1 2 6 7 1 2 5 8				0.2710	0.2570	0.0140
7 5 2 7 4 3				0.3630	0.3150	0.0480	1 3 6 8 1 3 5 9				0.2400	0.2230	0.0170
8 5 3 8 4 4				0.3820	0.3540	0.0280	1 4 6 9 1 4 5 1 0				0.2070	0.2010	0.0060
9 5 4 9 4 5				0.3990	0.3700	0.0290	7 7 0 7 6 1				0.2180	0.1570	0.0610
1 0 5 5 1 0 4 6				0.4030	0.3860	0.0170	8 7 1 8 6 2				0.2410	0.1820	0.0590
1 1 5 6 1 1 4 7				0.4090	0.3900	0.0190	9 7 2 9 6 3				0.2580	0.1970	0.0610
1 2 5 7 1 2 4 8				0.4000	0.3670	0.0330	1 0 7 3 1 0 6 4				0.2780	0.2070	0.0710
1 3 5 8 1 3 4 9				0.3800	0.3500	0.0300	1 1 7 4 1 1 6 5				0.2910	0.2220	0.0690
1 4 5 9 1 4 4 1 0				0.3600	0.3370	0.0230	1 2 7 5 1 2 6 6				0.3030	0.2500	0.0530
1 5 5 1 0 1 5 4 1 1				0.3370	0.3200	0.0170	1 3 7 6 1 3 6 7				0.3030	0.2970	0.0060*
1 6 5 1 1 1 6 4 1 2				0.3100	0.3000	0.0100	1 4 7 7 1 4 6 8				0.2980	0.3180	-0.0200
5 5 1 5 4 2				0.3010	0.2600	0.0410	1 5 7 8 1 5 6 9				0.2850	0.3220	-0.0370
6 5 2 6 4 3				0.3080	0.2650	0.0430	1 6 7 9 1 6 6 1 0				0.2730	0.3100	-0.0370
7 5 3 7 4 4				0.3140	0.2650	0.0490	7 7 1 7 6 2				0.2180	0.1570	0.0610
8 5 4 8 4 5				0.3180	0.2700	0.0480	8 7 2 8 6 3				0.2380	0.1800	0.0580
9 5 5 9 4 6				0.3240	0.2820	0.0420	9 7 3 9 6 4				0.2510	0.1930	0.0580
1 0 5 6 1 0 4 7				0.3170	0.3000	0.0170*	1 0 7 4 1 0 6 5				0.2670	0.2100	0.0570
1 1 5 7 1 1 4 8				0.2880	0.2960	-0.0080	1 1 7 5 1 1 6 6				0.2800	0.2400	0.0400
1 2 5 8 1 2 4 9				0.2510	0.2730	-0.0220	1 2 7 6 1 2 6 7				0.2920	0.2720	0.0200
1 3 5 9 1 3 4 1 0				0.2130	0.2570	-0.0440	1 3 7 7 1 3 6 8				0.3000	0.2950	0.0050*
1 4 5 1 0 1 4 4 1 1				0.1730	0.2280	-0.0550	1 4 7 8 1 4 6 9				0.2970	0.3050	-0.0080
1 5 5 1 1 1 5 4 1 2				0.1380	0.1880	-0.0500	1 5 7 9 1 5 6 1 0				0.2900	0.3100	-0.0200
1 6 5 1 2 1 6 4 1 3				0.1080	0.1500	-0.0420	1 6 7 1 0 1 6 6 1 1				0.2750	0.3050	-0.0300
1 7 5 1 3 1 7 4 1 4				0.0930	0.1070	-0.0140	4 4 1 4 1 4				0.4120	0.4410	-0.0290
6 6 0 6 5 1				0.2400	0.2170	0.0230	5 4 2 5 1 5				0.3730	0.4000	-0.0270
7 6 1 7 5 2				0.2680	0.2380	0.0300	6 4 3 6 1 6				0.3420	0.3720	-0.0300
8 6 2 8 5 3				0.2920	0.2500	0.0420	7 4 4 7 1 7				0.3300	0.3600	-0.0300
9 6 3 9 5 4				0.3180	0.2700	0.0480	8 4 5 8 1 8				0.3200	0.3450	-0.0250
1 0 6 4 1 0 5 5				0.3330	0.3000	0.0330	9 4 6 9 1 9				0.3100	0.3180	-0.0080
1 1 6 5 1 1 5 6				0.3520	0.3170	0.0350	1 0 4 7 1 0 1 1 0				0.3000	0.3050	-0.0050
1 2 6 6 1 2 5 7				0.3600	0.3160	0.0440	1 0 5 5 1 0 2 8				0.3220	0.3500	-0.0280
1 3 6 7 1 3 5 8				0.3630	0.3100	0.0530	1 1 5 6 1 1 2 9				0.3280	0.3500	-0.0220
1 4 6 8 1 4 5 9				0.3570	0.3050	0.0520	1 2 5 7 1 2 2 1 0				0.3400	0.3500	-0.0100
1 5 6 9 1 5 5 1 0				0.3480	0.3000	0.0480	7 5 3 7 2 6				0.3100	0.3160	-0.0060
1 6 6 1 0 1 6 5 1 1				0.3320	0.2950	0.0370	8 5 4 8 2 7				0.2880	0.3200	-0.0320
6 6 1 6 5 2				0.2470	0.1970	0.0500	9 5 5 9 2 8				0.2780	0.3180	-0.0400

Table 5 Smoothed values of self-broadened H<sub>2</sub>O widths b°(cm<sup>-1</sup>/atm) from this work compared to values from other studies (observed).

freq.	upper				lower				width		freq.	upper				lower				width	
	J	KA	KC	J	KA	KC	J	KA	smoothed	observed		J	KA	KC	J	KA	KC	smoothed	observed		
1817.47	12	1	12	11	0	11	0.207	0.220( 65)	1959.63	5	5	0	5	2	3	0.358	0.417( 29)				
1833.28	13	0	13	12	<b>1</b>	12	0.170	0.200( 59)	1961.18	8	3	5	7	2	6	0.381	0.452( 45)				
1848.81	14	1	<b>14</b>	13	0	13	0.166	0.165( 49)	1976.20	5	4	2	4	1	3	0.425	0.426( 42)				
1864.05	15	0	<b>15</b>	14	1	14	0.148	0.175( 52)	1981.33	14	4	11	13	3	10	0.250	0.356( 88)				
1879.02	16	1	16	15	0	15	0.130	0.170( 50)	1982.20	15	3	12	14	4	11	0.190	0.349( 87)				
1893.71	7	7	0	7	6	1	0.218	0.185( 55)	1983.03	7	4	4	7	1	7	0.330	0.352( 24)				
1940.27	8	8	1	8	7	2	0.168	0.174( 52)	1987.34	4	4	0	3	1	3	0.428	0.361( 25)				
1986.66	10	9	2	10	8	3	0.162	0.187( 56)	1988.40	8	5	4	7	4	3	0.338	0.394( 39)				
2016.84	7	6	1	6	5	2	0.237	0.311( 93)	<b>1993.26</b>	7	3	5	6	0	6	0.360	0.417( 41)				
2044.1	.2	9	8	6	3	7	5	2	<b>1998.93</b>	6	4	3	5	1	4	0.412	0.488( 48)				
2064.85	7	7	0	6	6	1	0.190	0.193( 57)	1999.95	6	5	2	6	2	5	0.327	<b>0.399( w)</b>				
2090.10	8	7	2	7	6	1	0.218	0.268( 80)	2007.70	9	5	5	8	4	4	0.352	0.361( 36)				
2136.14	8	8	1	7	7	0	0.149	0.167( 50)	2009.33	8	2	6	7	1	7	0.408	0.410( 40)				
2161.73	9	8	1	8	7	2	0.168	0.203( 60)	2013.91	16	4	13	15	3	12	0.180	0.335( 83)				
2205.22	9	9	0	8	8	1	0.138	0.177( 53)	2014.43	7	5	3	7	2	6	0.310	0.358( 89)				
2231.14	10	9	2	9	8	<b>1</b>	0.150	0.184( 55)	2018.34	9	5	4	8	4	5	0.315	0.345( 34)				
1777.89	11	6	6	10	7	3	0.255	0.170( <b>11</b> )	2019.07	9	3	6	8	2	7	0.352	0.416( 41)				
1778.76	10	4	6	9	5	5	0.388	0.277( 83)	2020.54	8	4	5	8	1	8	0.320	0.346( 86)				
1781.96	9	3	6	8	4	5	0.408	0.399( 39)	2023.03	10	5	6	9	4	5	0.370	0.346( 34)				
1788.36	8	5	3	8	4	4	0.382	0.350( 34)	2026.60	7	4	4	6	1	5	0.390	0.427( 42)				
1788.61	10	1	9	10	0	10	0.235	0.295( 29)	2027.03	5	4	1	4	1	4	0.421	0.415( 29)				
1796.93	8	5	4	8	4	5	0.318	0.304( 30)	2037.51	10	4	6	9	3	7	0.390	0.368( 110)				
1798.13	11	3	9	11	2	10	0.237	0.249( 24)	2043.95	8	3	6	7	0	7	0.330	0.388( 38)				
1798.59	9	5	5	<b>9</b>	<b>4</b>	<b>6</b>	0.324	0.288( 28)	2046.52	10	5	5	9	4	6	0.327	0.264( 34)				
1799.62	4	3	1	3	2	2	0.403	0.396( 39)	2046.80	13	5	9	12	4	8	0.360	0.515( 51)				
1801.93	10	5	6	10	4	7	0.317	0.265( 26)	2051.56	14	5	10	13	4	9	0.310	0.430( 55)				
1802.48	9	<b>1</b>	8	8	2	7	0.278	0.298( 29)	2060.48	8	4	5	7	1	6	0.370	0.416( 41)				
1805.15	5	3	2	5	0	5	0.445	0.460( 45)	2065.85	9	6	3	8	5	4	0.288	0.310( 30)				
1807.48	11	5	7	11	4	8	0.288	0.464( 46)	2072.54	6	4	2	5	1	5	0.412	0.309( 40)				
1807.70	9	2	8	8	1	7	0.313	0.343( 34)	2074.24	9	2	7	8	1	8	0.368	0.376( 37)				
1808.37	12	4	9	12	3	10	0.210	0.233( 23)	2078.57	11	5	6	10	4	7	0.338	0.292( 29)				
1808.66	11	1	10	11	0	11	0.205	0.244( 24)	2081.87	10	3	7	9	2	8	0.370	0.359( 107)				
1809.30	11	2	10	11	1	11	0.213	0.242( 24)	2087.41	10	6	5	9	5	4	0.310	0.281( 28)				
1810.63	5	3	3	4	2	2	0.424	0.450( 44)	2089.74	11	4	7	10	3	8	0.388	0.465( 116)				
1812.28	9	2	7	8	3	6	0.355	0.369( 36)	2090.36	5	5	1	4	2	2	0.368	0.366( 36)				
1813.05	12	2	10	12	1	11	0.217	0.179( 53)	2097.37	9	3	7	8	0	8	0.295	0.343( 102)				
1813.38	13	6	7	13	5	8	0.363	0.393( 98)	2100.43	9	4	6	8	1	7	0.350	0.381( 95)				
1814.95	13	5	9	12	6	6	0.317	0.365( 91)	2105.78	5	5	0	4	2	3	0.362	0.459( 114)				
1815.57	12	5	8	12	4	9	0.251	0.302( 75)	2106.35	6	5	2	5	2	3	0.382	0.441( 110)				
1816.66	12	5	7	11	6	6	0.320	0.350( 87)	2107.55	11	6	6	10	5	5	0.320	0.386( 96)				
1821.37	10	3	7	9	4	6	0.397	0.324( 42)	2114.43	11	6	5	10	5	6	0.302	0.263( 78)				
1822.76	10	1	9	9	2	8	0.245	0.259( 25)	2121.27	7	5	3	6	2	4	0.392	0.313( 21)				
1828.21	12	1	11	12	0	12	0.182	0.215( 15)	2124.29	12	6	7	11	5	6	0.327	0.337( 84)				
1828.53	12	2	11	12	1	12	0.182	0.234( 16)	2124.89	7	4	3	6	1	6	0.402	0.319( 22)				
1834.15	11	6	5	11	5	6	0.352	0.428(106)	2137.22	8	5	4	7	2	5	0.390	0.343(102)				
1835.89	6	3	3	6	0	6	0.438	0.377( 37)	2138.19	10	2	8	9	1	9	0.311	0.370( 92)				
1840.30	10	6	4	10	5	5	0.333	0.396( 98)	2139.33	10	7	4	9	6	3	0.260	0.226( 22)				
1846.47	11	6	6	11	5	7	0.288	0.335( 83)	2139.48	10	7	3	9	6	4	0.254	0.259( 77)				
1847.38	13	1	12	13	0	13	0.152	0.195( 58)	2139.82	12	6	6	11	5	7	0.295	0.380( 94)				
1851.85	13	5	8	12	6	7	0.310	0.435(108)	2144.71	14	6	9	13	5	8	0.340	0.348( 86)				
1852.41	5	4	1	<b>5</b>	<b>1</b>	<b>4</b>	0.417	0.416( 41)	2145.47	10	4	7	9	1	8	0.320	0.380( 94)				
1855.50	14	2	12	14	<b>1</b>	13	0.160	0.170( 11)	2147.41	11	3	8	10	2	9	0.341	0.381( 95)				
1856.26	6	4	2	6	1	5	0.410	0.361( 36)	2148.34	12	4	8	11	3	9	0.358	0.442(110)				
1857.63	12	4	8	11	5	7	0.350	0.466(116)	2152.56	10	3	8	9	0	9	0.262	0.360( 89)				
1858.52	9	3	7	8	2	6	0.362	0.384( 38)	2156.57	9	5	5	8	2	6	0.371	0.306( 21)				
1859.70	11	3	8	10	4	7	0.363	0.292( 29)	2160.70	13	5	8	12	4	9	0.322	0.464(115)				
1860.92	12	1	11	11	2	10	0.192	0.199( 19)	2162.89	11	7	5	10	6	<b>4</b>	0.278	0.309( 21)				
1861.53	12	2	11	11	1	10	0.192	0.208( 20)	2163.43	11	7	4	10	6	5	0.270	0.357( 24)				

**Table 5**      cent i nued

Table 6. Comparison of self-broadened widths: ratio of present/prior values

	Region	Range of ratio	Average ratio	RMS
Benedict/Kaplan theory (Ref. 4)		0.06 - 1.6	1.12	21%
HITRAN 92/96 16.5 $\mu\text{m}$ (Ref. 5)		<b>0.50 - 1.9</b>	1.07	15%
Mandin et al. (Ref. 3)	5 $\mu\text{m}$	0.67 - 1.86	1.10	22%
Langlois et al. (Ref. 16)	1.3 $\mu\text{m}$	1.03 - 1.11	1.07	7%40
Grossman/Browell (Ref. 17)	0.7 $\mu\text{m}$	0.83 - 1.27	1.05	11%